[COMMITTEE PRINT]

1992 NASA AUTHORIZATION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET REQUEST FOR FISCAL YEAR 1992

SUMMARY

PREPARED BY THE

SUBCOMMITTEE ON SPACE

TRANSMITTED TO THE

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

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*Ranking Republican Member.

LETTER OF TRANSMITTAL

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
U.S. HOUSE OF REPRESENTATIVES,
Washington, DC, March 14, 1991.

Hon. GEORGE E. BROWN, Jr.,
Chairman, Committee on Science, Space, and Technology, House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: I am transmitting herewith an overview of the fiscal year 1992 budget request of the National Aeronautics and Space Administration prepared by the Subcommittee on Space.

I believe this document will serve as an important reference and archive. Mr. Chairman, I commend this overview to you and to other Members of the Committee.

Sincerely,

RALPH M. HALL,
Chairman, Subcommittee on Space.

CONTENTS

	Page
NASA letter of transmittal	III
NASA final responses to FY 1992 budget preauthorization questions	1
NASA FY 1992 authorization bill	49
Material provided to the committee in support of the Department of Transportation request for FY 1992	68

NASA

National Aeronautics and
Space Administration

Washington, D.C.
20546

MAR 7 1991

Reply to Attn of: LB:MAP:L91-0020f

The Honorable George E. Brown
Chairman
Committee on Science, Space
and Technology
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

Enclosed are the final responses to written questions submitted by the Committee on January 4, 1991, with respect to NASA's FY 1992 Budget.

Sincerely,

Mary D. Kerwin
Director,
Congressional Liaison Division

Enclosure

QUESTION 1

Please furnish the following tabulation by major program, for the FY 1992 request:

a. The original budget request submitted by NASA to OMB.
b. The adjustments made.
c. The submission to Congress.
d. Brief comments on the adjustments made, i.e., a description of corresponding program impacts or changes.
e. The comparative FY 1991 operating plan changes.
f. Please assign an agency priority to those programs requested from OMB, but not presented to Congress.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
FY 1992 BUDGET
(Millions of Dollars)

	FY 1991 OP PLAN	FY 1992 OMB REQUEST	FY 1992 CONG REQUEST	CHANGE	
RESEARCH AND DEVELOPMENT	6023.6	8464.2	7198.5	-1265.7	
Space Station	1900.0	2909.0	2028.9	-880.1	Program Restructure FTS transferred to OAET
Space Transportation Capability Dev	602.5	877.5	879.8	2.3	
Upper Stages Dev & Operations	82.2	140.9	108.5	-32.4	Delete IUS for TDRS-8/defer Centaur for CRAF
Spacelab Dev & Operations	129.3	150.2	150.2		
Engineering & Technical Base	208.5	245.0	235.2	-9.8	General reduction
Payload Operations & Support Equip	101.5	150.5	144.5	-6.0	General reduction
Tethered Satellite System	21.9	12.6	12.6		
Advanced Programs	35.2	38.8	53.8	15.0	Augmentation for advanced transportation studies
New Launch System	23.9	139.5	175.0	35.5	Initiation of New Launch System
Space Science and Applications	2429.6	3205.3	2934.6	-270.7	
Physics and Astronomy	975.1	1226.1	1140.6	-85.5	
Gamma Ray Observatory	22.0				
AXAF	101.2	211.0	211.0		
Global Geospace Science	96.6	65.3	65.3		
Spacelab P/L Develop & Mission Mgmt	88.8	111.5	88.0	-23.5	Reduced flights
Space Station Utilization	3.0	54.0		-54.0	Consistent with SSF restructure
Payload & Instrument Development	94.6	115.9	115.9		
Explorer Development	99.8	107.9	107.9		
Mission Operations & Data Analysis	313.3	388.4	388.4		
Research and Analysis	100.8	111.1	103.1	-8.0	Reduce funding for Exploration Technology
Suborbital Program	55.0	61.0	61.0		
Life Sciences	138.0	209.7	183.9	-25.8	
Flight Experiments	81.1	105.0	89.7	-15.3	Defer SSF related science consistent with restructure
Research & Analysis	56.9	80.7	79.2	-1.5	Reduce funding for Exploration Technology
Lifesat	(2.0)	24.0	15.0	-9.0	Slow front end

	FY 1991 OP PLAN	FY 1992 OMB REQUEST	FY 1992 CONG REQUEST	CHANGE	
Planetary Exploration	457.1	658.7	627.3	-31.4	
Ulysses	3.0				
Mars Observer	78.5	54.4	54.4		
Mars Balloon Relay Experiment	1.5	1.2	1.2		
CRAF/Cassini	145.0	328.0	328.0		
Lunar Observer		10.6			
Mission Operations & Data Analysis	161.2	165.8	150.5	-10.6	Defer Lunar Observer
Research and Analysis	67.9	98.7	93.2	-15.3	Delete Mars Observer Enhancement & Exp Tech
				-5.5	Delete funding for Exploration Technology
Space Applications	859.4	1110.8	982.8	-128.0	
Earth Science & Applications	667.9	898.8	775.6	-123.2	
Earth Observing System	191.0	460.0	336.0	-124.0	Slower build-up
(Instruments)	(79.0)	(235.9)	(159.9)	(-76.0)	
(Observatory)	(60.0)	(89.5)	(58.5)	(-31.0)	
(Science)	(16.0)	(61.0)	(35.0)	(-26.0)	
(EOSDIS)	(36.0)	(73.6)	(82.6)	(9.0)	
Remotely Piloted Aircraft	54.7	68.2	68.2	5.0	OMB directed augmentation
Earth Probes	64.0	18.2	18.2		
UARS	76.0	51.9	51.9		
TOPEX	49.7	48.6	48.6		
Payload & Instrument Development	232.5	251.9	247.7		
Applied Research, Data Analysis & Related					
Materials Processing	102.3	129.5	125.8	-4.2	General reduction
Space Communication	52.5	39.4	39.4	-3.7	Reduce consistent with SSF restructure
Search and Rescue	1.4	1.3	1.3		
ACTS Development	34.0	11.2	11.2		
Applied Research, Data Analysis & Related	17.1	26.9	26.9		
Information Systems	36.7	43.1	42.0	-1.1	General reduction
Commercial Programs	86.0	154.1	150.0	-4.1	General reduction
Technology Utilization	24.4	32.2	32.0	-0.2	
Commercial Use of Space	61.6	121.9	118.0	-3.9	

QUESTION 2

Please furnish the following information, by NASA Center and by major program, for the FY 1992 budget request:

a. Original Center request to NASA Headquarters.
b. The adjustments made.
c. Brief comments on adjustments made.
d. The submission to Congress as allocated by Center.
e. The comparative FY 1991 operation plan figure, by Center.

	FY 1991 OP PLAN	FY 1992 OMB REQUEST	FY 1992 CONG REQUEST	CHANGE	
Aeronautical Research and Technology	512.0	601.2	591.2	-10.0	
Research and Technology Base	336.4	375.6	375.6		
Systems Technology Programs	175.6	225.6	215.6	-10.0	
High Performance Computing	17.0	17.0	17.0		
Materials & Structures Sys Tech	39.9	40.1	40.1		
Rotocraft Systems Technology	5.1	5.2	5.2		
High-Performance Aircraft Sys Tech	10.5	11.1	11.1		
Advanced Propulsion Systems Tech	15.0	15.4	15.4		
Numerical Aerodynamic Simulation	44.1	45.4	45.4		
High Speed Research	44.0	76.4	76.4		
Advanced Subsonic Technology		15.0	5.0	-10.0	Reduce augmentation
Space Research and Technology	290.4	524.9	421.8	-103.1	
Research and Technology Base	125.7	141.6	141.6		
In-Space Flight Experiments	11.2	16.0	16.0		
Civil Space Technology Initiative	119.0	164.7	114.3	-50.4	
Operations	21.8	36.4	32.4	-4.0	Delete life support tech consistent with SSF restructure
Transportation	56.8	107.9	63.5	-44.4	Delay AFE one year
Science	18.2	20.4	18.4	-2.0	Augmentation for segmented reflectors program
Automation and Robotics	22.2				Transferred to Space Automation & Telerobotics
Space Automation & Telerobotics	(22.2)	27.9	82.9	55.0	
Flight Telerobotics Servicer			55.0	55.0	Transferred from SSF. Refocus on technology development
Telerobotics	(11.0)	14.8	14.8		
Artificial Intelligence	(11.2)	13.1	13.1		
Exploration Technology	27.5	91.7	52.0	-39.7	Reduce increase for Exploration Technology
Space Transportation	6.0	16.5	9.0	-7.5	
In-Space Operations	2.0	5.0		-5.0	
Surface Operations	13.8	32.7	20.0	-12.7	
Human Support	3.5	16.2	16.0	-0.2	
Lunar and Mars Science	0.7	5.5		-5.5	
Information Systems & Automation		2.8		-2.8	
Nuclear Propulsion	0.5	7.0	7.0		
Innovative Technologies & Systems Analysis	1.0	6.0		-6.0	
Mission Studies					
Exploration Mission Studies	7.0	83.0	15.0	-68.0	Reduce increase for Mission Studies
Transatmospheric R&T	95.0	72.0	72.0		
Safety, Reliability, & Quality Assurance	33.0	33.6	33.6		
Academic Programs	55.1	64.6	64.6		
Tracking and Data Advanced Systems	20.0	22.0	22.0		

	FY 1991 OP PLAN	FY 1992 OMB REQUEST	FY 1992 CONG REQUEST	CHANGE	
SPACE FLIGHT, CONTROL & DATA COMMUNICATIONS	5124.4	6112.5	5608.3	-504.2	
Shuttle Production	1276.4	1561.4	1288.9	-272.5	
Orbiter Operational Capability	275.6	357.4	273.8	-83.6	Structural Spares -75M/Gen reduction -9M
Propulsion Systems	747.8	742.4	622.7	-119.7	ASRM reduction & equipment to CoF
Launch & Mission Support	253.0	284.3	270.1	-14.2	General reduction
Assured Shuttle Availability		147.3	122.3	-25.0	Reduce & rephase candidate projects
OV-106		30.0		-30.0	Did not approve fifth orbiter vehicle
Space Shuttle Operations	2790.0	3163.7	3023.6	-140.1	Flight Savings -82M/General reduction -85M/ DOD range support +27M
Flight Operations	801.5	921.4	912.5	-8.9	
Flight Hardware	1393.3	1572.2	1417.0	-155.2	
Launch & Landing Operations	595.2	670.1	694.1	24.0	
Expendable Launch Vehicles	229.2	274.2	341.9	67.7	Add ELV for TDRS-7 +41M/Accelerate payment schedule for Cassini +56M/Defer CRAF -28M/Delay ADTRSS -1.3M
Space & Ground Networks Communications & Data Systems	828.8	1113.2	953.9	-159.3	
Space Network	310.1	392.5	348.0	-44.5	TDRSS Loan Payment to FFB +33M/Cancel F-8 -39M/ Delay ATDRSS -38M
Ground Network	260.7	314.0	291.7	-22.3	Reduce level of mission support/Exploration Tech -4M
Communications and Data Systems	258.0	406.7	314.2	-92.5	Rephase CDOS -43M/reduce level of support -50M
RESEARCH AND PROGRAM MANAGMENT	2211.9	2518.0	2452.3	-65.7	Reduce civil service augmentation and baseline Operation of Installation requirements
CONSTRUCTION OF FACILITIES	497.9	572.2	480.3	-91.9	ASRM Equip +50M/Exp Tech -23M/SSF Facilities -41M/ Flt Hardware Dev Fac -27M/34-Meter Antenna -15M/ Rocket Eng Test Fac -11M/Earth Sys Sci Bldg -10M/ Restore Test Area Spt Sys at MSFC -9M/ Davis-Bacon reduction -6M
INSPECTOR GENERAL	10.5	14.6	14.6	____	
TOTAL NASA	13868.3	17681.5	15754.0	-1927.5	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

HEADQUARTERS

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
SPACE STATION	1,988.0	3,087.8	-1,059.9	2,028.9	Distribution under review pending program restructuring - total budget at Headquarters
STS CAPABILITY DEVELOPMENT	16.2	15.3	0.0	15.3	
SHUTTLE PRODUCTION & OPS CAP	15.6	44.4	0.0	44.4	
STS OPERATIONS	24.4	45.9	0.0	45.9	
PHYSICS AND ASTRONOMY	74.2	84.2	0.0	84.2	
LIFE SCIENCES	18.5	24.8	0.0	24.8	
PLANETARY EXPLORATION	46.0	49.7	0.0	49.7	
SPACE APPLICATIONS	51.2	59.0	0.0	59.0	
TECHNOLOGY UTILIZATION	15.5	13.3	11.3	24.6	Transfer MTTC management to HQ
COMMERCIAL USE OF SPACE	42.8	72.3	-12.7	59.6	Reduction in commercial transportation requirements
SBIR/STTR	15.8	21.5	-8.3	13.2	Deferred lower priority augmentations
AERONAUTICAL RESEARCH & TECH	12.4	14.0	-0.6	13.4	Decrease in proposed funding for High Performance Computing
SPACE RESEARCH AND TECH	36.6	61.8	-7.5	54.3	Delete proposed increase for University Space Engineering Research Centers, reduction of proposed level of funding for Exploration Technology offset by increase in Exploration Mission Studies
TRANSATMOSPHERIC RES & TECH	82.8	54.8	0.0	54.8	
SPACE & NETWORK COMMUN & DATA	42.7	49.4	27.3	76.7	Funds added for final FFB payout offset by reduction in HQ contracts
ACADEMIC PROGRAMS	36.9	47.2	0.0	47.2	
TOTAL	2,432.5	3,745.4	-1,049.4	2,696.0	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

JOHNSON SPACE CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	190.4	341.6	-93.0	248.6	Reduce ETB engineering augmentation, OMV termination, reduce satellite servicing studies, defer station support pending restructuring
SHUTTLE PRODUCTION & OPS CAP	379.2	482.0	-54.9	427.1	Defer structural spares, added loads analysis for ASRM, DoD withdrawl of secure ops
STS OPERATIONS	889.0	903.7	-6.9	896.8	Defer equipment purchases, savings from reduced flight rate
PHYSICS AND ASTRONOMY	15.8	17.2	0.0	17.2	
LIFE SCIENCES	54.6	76.0	0.0	76.0	
PLANETARY EXPLORATION	0.0	9.4	0.0	9.4	
SPACE APPLICATIONS	1.4	2.6	0.0	2.6	
TECHNOLOGY UTILIZATION	4.2	3.5	-0.9	2.6	
COMMERCIAL USE OF SPACE	18.5	41.7	6.2	47.9	CHAM funding levels negotiated
SR&QA	2.2	2.4	-0.1	2.3	Reductions in reliability assessment program augmentation
SPACE RESEARCH AND TECH	16.8	144.4	-119.1	25.3	Reductions to proposed increases in CSTI, Exploration Technology, Exploration Mission Studies
ACADEMIC PROGRAMS	2.0	2.0	0.1	2.1	
TOTAL	1,494.1	2,026.5	-268.8	1,757.9	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

MARSHALL SPACE FLIGHT CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	252 6	363 6	54 6	418 2	Add new Launch System, delete TDRS-H 105, reduce ETB engineering enhancement
SHUTTLE PRODUCTION & OPS CAP	710 2	806 4	-127 1	679 3	Rephase ASRM, reduce SSME manpower growth, transfer SRM project support from Ops
STS OPERATIONS	1,158 6	1,273 0	-106 6	1,166 4	Savings from reduced flight rate, reduce SSME manpower growth, transfer SSME project support to Production
PHYSICS AND ASTRONOMY	215 4	372 6	-71 2	301 0	Rephasing of requirements based on change in launch schedule
PLANETARY EXPLORATION	0 2	0 2	0 0	0 2	
SPACE APPLICATIONS	49 1	60 0	0 0	60 0	
TECHNOLOGY UTILIZATION	0 5	2 8	-2 4	0 4	Reduction in number of application projects
COMMERCIAL USE OF SPACE	1 0	2 4	-1 0	1 4	Deferral of proposed activities
SR&QA	1 5	2 2	-0 1	2 1	Deferral of FMEA software reliability augmentation
SPACE RESEARCH AND TECH	57 2	184 0	-100 2	84 0	Reductions of proposed increases in RET base, CSTI, Exploration Technology, Exploration Mission Studies
SPACE & NETWORK COMMUN & DATA	55 3	74 5	-8 5	66 0	Reduced funding for program support communications
ACADEMIC PROGRAMS	2 7	2 5	0 0	2 5	
TOTAL	2,504 3	3,125 2	-362 5	2,762 7	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

KENNEDY SPACE CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	117.2	135.0	-7.2	127.8	Reduction to Spacelab manifest, station support due to restructuring
SHUTTLE PRODUCTION & OPS CAP	143.8	107.5	0.0	107.5	
STS OPERATIONS	796.6	900.2	14.9	915.1	Additional range costs offset by reductions in orbiter logistics, program mission support support, flight savings
PHYSICS AND ASTRONOMY	10.2	10.3	0.0	10.3	
LIFE SCIENCES	5.4	0.0	0.0	0.0	
TECHNOLOGY UTILIZATION	0.4	0.7	-0.2	0.5	
COMMERCIAL USE OF SPACE	0.6	1.3	-0.2	1.1	
R&GA	1.6	2.2	-0.5	1.7	Defer augmentations in software hazards and reliability maintenance
SPACE RESEARCH AND TECH	2.9	5.1	-0.6	4.5	Reduction to Exploration Technology
ACADEMIC PROGRAMS	1.4	1.4	0.0	1.4	
TOTAL	1,078.3	1,171.7	6.2	1,177.9	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

STENNIS SPACE TECHNOLOGY LABORATORIES

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	0 1	26 3	-1 5	24 8	Add new Launch System offset by transfer of Exploration activities to MLS
SHUTTLE PRODUCTION & OPS CAP	22 4	28 0	2 6	30 6	Rephase ASRM equipment from FY91
STS OPERATIONS	2 5	2 0	-0 5	2 4	Delete NPT test stand maintenance
LIFE SCIENCES	0 1	0 1	0 0	0 1	
SPACE APPLICATIONS	0 5	0 7	0 0	0 7	
TECHNOLOGY UTILIZATION	0 6	10 6	-10 0	0 6	Transfer of NTTC management to HQ
COMMERCIAL USE OF SPACE	4 7	6 0	-0 4	5 6	
SREQA	0 4	0 9	-0 3	0 6	Deferral of proposed augmentations in thermal imaging, and CFC alternative techniques
SPACE RESEARCH AND TECH	0 0	1 0	-1 0	0 0	Reduction to Exploration Technology
ACADEMIC PROGRAMS	1 0	1 1	0 0	1 1	
TOTAL	41 5	77 6	-11 1	66 5	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

GODDARD SPACE FLIGHT CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	13.2	18.8	-4.4	14.4	Delete proposed Spacelab equipment, adjust Hitchhiker program
STS OPERATIONS	109.7	122.7	-13.2	109.5	Slip Lifeset ELVs consistent with launch schedule, reprice four MELV missions
PHYSICS AND ASTRONOMY	623.1	890.9	-204.0	686.9	Rephase GGS denied, HST partial reinstatement
LIFE SCIENCES	0.4	0.7	0.0	0.7	
PLANETARY EXPLORATION	17.3	10.2	0.0	10.2	
SPACE APPLICATIONS	436.5	576.4	-121.0	455.4	Reduce EOS
TECHNOLOGY UTILIZATION	0.8	1.7	-0.7	1.0	
COMMERCIAL USE OF SPACE	1.0	2.5	-1.1	1.4	Reduction of proposed robotics new start
SR&QA	2.8	4.7	-1.8	2.9	Deferral of augmentations in electronic packaging, radiation materials science, mechanical parts database
AERONAUTICAL RESEARCH & TECH	0.8	0.6	-0.1	0.5	Decrease request in High Performance Computing
SPACE RESEARCH AND TECH	10.8	23.2	48.4	71.6	Transfer of Flight Telerobotic Servicer offset by reductions to CSTI, Exploration Technology
SPACE & NETWORK COMMUN & DATA	574.5	756.9	-135.9	621.0	Cancel TDRS F-8, defer advanced TDRS, reduce proposed upgrades for Space Network, Ground Communications and Ground Networks
ACADEMIC PROGRAMS	2.5	2.0	0.0	2.0	
TOTAL	1,793.4	2,419.3	-433.8	1,985.5	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

JET PROPULSION LABORATORY

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
GTS CAPABILITY DEVELOPMENT	0 6	2 3	-1 9	0 4	Reduce satellite servicing studies
SHUTTLE PRODUCTION & OPS CAP	1 0	5 8	-5 8	0 0	cancel support to SSME, SRM nozzle studies, ASRM
PHYSICS AND ASTRONOMY	16 0	30 8	0 0	30 8	
LIFE SCIENCES	1 4	2 0	0 0	2 0	
PLANETARY EXPLORATION	371 2	597 5	-61 8	535 7	Funds reduced for Magellan extended ops, rephasing of CRAF/ Cassini, denied request for multimission software
SPACE APPLICATIONS	186 5	249 8	-0 1	249 7	
TECHNOLOGY UTILIZATION	0 5	0 9	-0 4	0 5	
S&MA	3 9	4 7	-0 8	3 9	Reduced proposed augmentations for radiation test program and advanced microelectronics
AERONAUTICAL RESEARCH & TECH	1 0	0 8	-0 1	0 7	Decrease request for High Performance Computing
SPACE RESEARCH AND TECH	35 4	111 6	-76 2	35 4	Reductions of proposed increases to R&T base, CSTI program, Exploration Technology, Exploration Mission Studies
SPACE & NETWORK COMMUN & DATA	142 3	207 4	-11 1	196 3	Defer various DSN and operations upgrades
ACADEMIC PROGRAMS	1 0	1 6	0 0	1 6	
TOTAL	781 6	1,215 2	-158 2	1,057 0	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

LANGLEY RESEARCH CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	1 3	0.7	0 4	1 1	Additional advanced transportation studies
LIFE SCIENCES	0 5	0 7	0 0	0 7	
SPACE APPLICATIONS	25 8	36 8	0 0	36 8	
TECHNOLOGY UTILIZATION	0 7	1 3	-0 6	0 7	
COMMERCIAL USE OF SPACE	0 4	0 3	0 0	0 3	
SR&QA	1 9	2 9	-0 1	2 8	Partial deferral of proposed augmentations in nondestructive evaluation (NDE)
AERONAUTICAL RESEARCH & TECH	180 3	226 9	-20 3	206 6	Reductions in Enabling Propulsion Materials, Advanced subsonic technology, High-Performance computing
SPACE RESEARCH AND TECH	53 9	127 8	-64 3	63 5	Reductions of proposed increases to CSTI, Exploration Technology, Exploration Mission Studies
TRANSATMOSPHERIC RES & TECH	5 1	7 5	0 0	7 5	
ACADEMIC PROGRAMS	4 0	3 1	0 0	3 1	
TOTAL	273 9	408 8	-84 9	323 1	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

LEWIS RESEARCH CENTER

(millions of dollars)

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
STS CAPABILITY DEVELOPMENT	1.9	23.7	3.5	29.2	Defer CRAF upper stage, adjust Cassini transportation studies
SHUTTLE PRODUCTION & OPS CAP	4.8	4.8	-4.8	0.0	Transfer SSME support to Marshall Space Flight Center
STS OPERATIONS	112.6	168.4	54.6	223.0	Add ELVs for ATDRS, TDRS-G, defer CRAF ELV, adjust Cassini ELV for no gyrid pre qual, adjust SOHO, Mars Observer, EOS-A ELV, reduce mission analysis, cancel Lunar Observer ELV
PHYSICS AND ASTRONOMY	0.0	0.5	0.0	0.5	
SPACE APPLICATIONS	69.7	68.0	0.0	68.0	
TECHNOLOGY UTILIZATION	0.4	0.0	-0.4	0.5	
COMMERCIAL USE OF SPACE	0.2	0.2	0.0	0.2	
SBIR/A	2.9	4.5	-0.7	3.8	Deferral of proposed augmentations in design engineering standards and carbon fiber research
AERONAUTICAL RESEARCH & TECH	120.9	198.3	-19.8	178.5	Reductions to funding proposed for Enabling Propulsion Materials, Advanced subsonic technology, High-Performance Computing
SPACE RESEARCH AND TECH	58.1	195.1	-126.7	68.4	Reductions of increases to CSTI, Exploration Technology, Exploration Mission Studies
TRANSATMOSPHERIC RES & TECH	3.6	5.3	0.0	5.3	
SPACE & NETWORK COMMUN & DATA	1.1	0.0	1.4	1.4	Add Advanced TDRSS studies
ACADEMIC PROGRAMS	1.8	1.7	0.0	1.7	
TOTAL	377.2	664.6	-92.1	572.5	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

AMES RESEARCH CENTER

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request	Remarks
GTS OPERATIONS	5 8	6 8	-0 4	6 4	Reestimate Shuttle landing support
PHYSICS AND ASTRONOMY	20 3	9 1	0 0	9 1	
LIFE SCIENCES	57 1	81 2	-9 7	71 5	Centrifuge rephased due to Space Station restructure
PLANETARY EXPLORATION	13 5	14 1	0 0	14 1	
SPACE APPLICATIONS	38 7	50 6	0 0	50 6	
TECHNOLOGY UTILIZATION	0 4	1 1	-0 7	0 4	Defer planned activities
COMMERCIAL USE OF SPACE	0 4	1 5	-0 9	0 6	Defer planned activities
SSE&A	0 3	0 4	0 0	0 4	
AERONAUTICAL RESEARCH & TECH	188 6	216 4	-16 9	199 5	Deletion of proposed increase to Numerical Aerodynamic Simulator, reduction to Advanced Subsonic Technology, High-Performance Computing
SPACE RESEARCH AND TECH	27 6	86 3	-52 1	34 2	Reductions of proposed increases in Exploration Technology, Exploration Mission studies, OAST base, CSTI program
TRANSATMOSPHERIC RES & TECH	3 5	4 4	0 0	4 4	
SPACE & NETWORK COMMUN & DATA	13 0	17 5	-3 0	14 5	Defer mobile radar systems upgrades
ACADEMIC PROGRAMS	2 0	2 0	0 0	2 0	
TOTAL	371 2	491 4	-83 7	407 7	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION -- FY 1992 BUDGET REQUEST
RESEARCH AND DEVELOPMENT/SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

(millions of dollars)

TOTAL ALL CENTERS

	FY 1991 Current Estimate	FY 1992 Center Request	Difference	FY 1992 Budget Request
HEADQUARTERS	2,432.5	3,745.4	-1,049.4	2,696.0
JOHNSON SPACE CENTER	1,494.1	2,026.5	-268.6	1,757.9
MARSHALL SPACE FLIGHT CENTER	2,504.3	3,125.2	-362.5	2,762.7
KENNEDY SPACE FLIGHT CENTER	1,078.3	1,171.7	6.2	1,177.9
STENNIS SPACE TECHNOLOGY LABORATORIES	41.5	77.6	-11.1	66.5
GODDARD SPACE FLIGHT CENTER	1,793.4	2,419.3	-433.8	1,985.5
JET PROPULSION LABORATORY	781.6	1,215.2	-158.2	1,057.0
LANGELY RESEARCH CENTER	273.9	408.0	-84.9	323.1
LEWIS RESEARCH CENTER	377.2	664.6	-92.1	572.5
AMES RESEARCH CENTER	371.2	491.4	-83.7	407.7
TOTAL	11,148.0	15,344.9	-2,538.1	12,806.8

QUESTION 3

Please provide the following tabulations of projected total cost for all major programs. The estimate should include the Project Operation Plan (POP) and the Program level costs (including reserves, management overhead, etc.)

a. Original estimate date and amount.
b. Current estimate.
c. NASA's estimate of what portion of any increased cost may be due to inflation.

QUESTION 4

Please provide an analysis of the effect of inflation on the aggregate buying power of NASA.

QUESTION 5

Please furnish by major program the accumulated unobligated balance of funds for FY 1990 and prior years; the unobligated balance of FY 1991 funds as of December 31, 1990, and the projected level of accumulated unobligated balances that will exist on September 30, 1991.

1992 CONGRESSIONAL BUDGET

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ESTIMATED TOTAL PROJECT COST
(in millions of dollars)

	Original Development Estimate		Current Estimate
	Date	Range	
Hubble Space Telescope	1/78	435-470	1545 (a)
Gamma Ray Observatory	1/80	180-225	555-565 (b)
Ulysses	1/83	120-140	169 (c)
Tethered Satellite	1/83	40-50	145-150 (d)
Magellan	1/84	320-350	463 (e)
Advanced Communications Technology Satellite	1/84	325-425	499 (f)
Mars Observer	1/84	300-375	450-500 (g)
Upper Atmospherics Research Satellite	1/84	630-700	620-670 (h)
Scatterometer	1/84	120-135	190-210 (i)
Ocean Topography Experiment (TOPEX)	1/86	380-430	380-410 (j)
Global Geospace Science	1/87	390-440	360-400 (k)
Collaborative Solar Terrestrial Research	1/87	220-260	310-360 (l)
Advanced X-Ray Astrophysics Facility	1/88	1,540-1,700	1,620-1,800 (m)
CRAF/Cassini	1/89	1,550-1,750	1,600 (n)
Earth Observing System	1/90	17,000-20,000	16,000-18,000 (o)
Lifesat	1/91	600-700	

NOTES

(a) The original Hubble Space Telescope estimate supported a late 1983 launch and was stated in FY 1978 dollars, to be updated annually. This current estimate reflects the actual total development cost in real year dollars.

(b) Reestimate due to budget constraints resulting in the mission being descoped and the launch delayed from 1985 to 1988. Launch delayed from 1988 to January 1990 due to the Challenger accident. Recent launch delays due to STS manifest changes resulting in a April 1991 launch.

(c) Current estimate reflects actual development costs through launch in October 1990.

(d) The current cost estimate for the Tether Satellite System deployer and systems integration includes cost increases resulting from a 5 year launch delay, added modifications due to safety concerns, and integration/test problems with the deployer system for a 1992 launch.

(e) Current estimate reflects actual development costs through launch May 1989.

(f) The current estimate reflects the Congressionally-mandated budget cap.

(g) Mars Observer was originally scheduled for launch in 1990 aboard the Shuttle with TOS upper stage but replanned after the Challenger accident for launch on a Titan III/TOS in 1992.

(h) The current budget range is reduced from last year due to the removal of missions operations funding from the development estimate through launch.

(i) Scatterometer was planned for a launch in October 1988 aboard N-ROSS (Navy) satellite. Launch was later delayed due to cancellation of the N-ROSS program. Current estimate reflects rebaselined mission to be flown aboard Japanese ADEOS satellite in 1995.

(j) Topex was originally planned for an Ariane launch in May 1991. Overruns of systems contractor (Fairchild) led to an one year launch delay with some cost growth. Current estimate reflects cost growth due to launch delay to June 1992 offset by segregation of mission operations funding requirements from development activities through launch.

(k) The current budget range is reduced from last year due to the removal of missions operations funding from the development estimate.

(l) Development range increased due to additional US responsibilties and instrument funding requirements.

(m) Increase due to program and budget modified by Congressional direction in FY 1989 to include a three year mirror technology demonstration program. FY 1991 budget reduction has required deferrals of instrument and spacecraft development. The program is being replanned consistent with these and outyear reductions to a launch date in early 1998.

(n) The current estimate reflects Congressionally-mandate ceiling which caps program at $1.6 billion.

(o) The Earth Observing System (EOS) was submitted in FY 1991 as part of the Global Change Research Program. The development range was reduced to reflect the outcome of the FY 1992 budget formulation. The cost estimate covers the period through 2000. The original plan for the EOS-B series of platforms is under review.

National Aeronautics and Space Administration

EFFECT OF INFLATION ON NASA BUDGET
COMPARATIVE PURCHASING POWER INDICES FY 1973 - 1992

	GNP Price Deflator (%) 1/	NASA Aerospace Price Deflator (%) 2/	Budget Outlays - Millions of Dollars Actuals	Constant FY 1973 3/	Constant FY 1973 4/
FY 1973	100.0	100.0	3315	3315	3315
FY 1974	91.7	93.3	3256	3037	2984
FY 1975	83.5	84.2	3267	2751	2727
FY 1976	78.5	77.2	3669	2834	2879
FY 1977	73.5	71.2	3945	2808	2901
FY 1978	68.5	66.0	3983	2630	2729
FY 1979	62.9	60.3	4197	2531	2641
FY 1980	57.7	54.5	4852	2643	2801
FY 1981	52.6	49.1	5426	2665	2856
FY 1982	49.5	44.9	6035	2710	2985
FY 1983	47.6	42.3	6664	2820	3172
FY 1984	45.9	40.0	7048	2817	3235
FY 1985	44.6	38.4	7318	2812	3262
FY 1986	43.4	37.2	7403	2757	3216
FY 1987	42.1	35.9	7592	2723	3196
FY 1988	40.8	34.5	9092	3139	3705
FY 1989	39.1	32.6	11051	3613	4326
FY 1990	37.6	31.3	12428	3888	4669
FY 1991 5/	36.1	29.7	13497	4006	4866
FY 1992 5/	34.7	28.1	14719	4137	5102

1/ Department of Commerce, Bureau of Economic Analysis.
2/ Reflects labor intensive nature of NASA purchases using aerospace related inflation data.
3/ Constant FY 1973 outlays calculated using the NASA Aerospace Price Deflator.
4/ Constant FY 1973 outlays calculated using the GNP Price Deflator.
5/ Current estimates.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
UNOBLIGATED BALANCES BY MAJOR PROGRAM 9/30/90, 12/31/90 & 9/30/91
(Millions of Dollars)

APPROPRIATION/PROGRAM	FY 1990 & PRIOR UNOBLIGATED BALANCE 9/30/90	FY 1991 UNOBLIGATED BALANCE 12/31/90	ESTIMATED UNOBLIGATED BALANCE 9/30/91
RESEARCH AND DEVELOPMENT	345.2	4,722.7	301.2
SPACE STATION	89.5	1,484.6	93.0
SPACE TRANSPORTATION CAPABILITY DEVELOPMENT	57.3	488.7	38.1
PHYSICS AND ASTRONOMY	78.1	774.2	48.8
LIFE SCIENCES	4.3	117.2	6.8
PLANETARY EXPLORATION	21.8	295.1	21.9
SPACE APPLICATIONS	46.4	706.1	43.8
COMMERCIAL PROGRAMS	6.4	75.1	4.3
SPACE RESEARCH AND TECHNOLOGY	20.2	249.2	14.4
TRANSATMOSPHERIC RESEARCH AND TECHNOLOGY	1.6	84.8	4.8
AERONAUTICAL RESEARCH AND TECHNOLOGY	14.7	438.4	25.8
SAFETY, RELIABILITY AND QUALITY ASSURANCE	3.9	26.5	1.7
UNIVERSITY SPACE SCIENCE & TECHNOLOGY ACADEMIC PROGRAM	9.3	55.1	2.8
TRACKING AND DATA ADVANCED SYSTEMS	0.5	14.5	1.8
SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS	393.1	2,451.5	256.2
SHUTTLE PRODUCTION AND OPERATIONAL CAPABILITY	224.8	1,812.1	63.8
(REPLACEMENT ORBITER)	(127.8)	(0.0)	(0.0)
SPACE TRANSPORTATION OPERATIONS	131.3	1,960.1	151.8
SPACE AND GROUND NETWORK, COMMUNICATIONS AND DATA SYSTEMS	37.8	471.3	41.4
CONSTRUCTION OF FACILITIES	291.8	495.9	199.2
OFFICE OF INSPECTOR GENERAL	0.0	0.4	0.0
RESEARCH AND PROGRAM MANAGEMENT	0.0	1,894.5	0.0
TOTAL, NASA	1,930.1	10,373.0	756.0

BT 1/17/91

QUESTION 6

In accordance with Rule XI, Clause 2(1)(4) of the Rules of the House of Representatives, the Committee is required to include in the report accompanying the NASA authorization bill an assessment of the impact of the legislation on inflation. Please provide the Committee with any information or reports which would be useful to the Committee in fulfilling this requirement.

41-108 O - 91 - 3

Question 6:

In accordance with Rule XI, Clause 2 (1) (4) of the Rules of the House of Representatives, the Committee is required to include in the report accompanying the NASA authorization bill an assessment of the impact of the legislation on inflation. Please provide the Committee with any information or reports which would be useful to the Committee in fulfilling this requirement.

Answer 6:

In accordance with Rule XI, Clause 2 (1) (4) of the Rule of the House of Representatives this legislation is assessed to have no adverse long-run inflationary effects on prices and cost in the operation of the national economy. NASA expenditures are labor intensive, with approximately 80 percent of spending directly for jobs and the remainder for materials. In FY 1991, NASA will employ about 23,829 civil servants and support about 199 thousand contractor and support services employees. Assuming a multiplier effect of 2.5, the total short-run employment effect on the United States' economy in FY 1990 is about 557,000 jobs. In FY 1992, NASA will employ 24,197 civil servants and support about 217 thousand contractor and support services employees. Assuming a multiplier effect of 2.5, the total short-run employment effect on the United States economy in FY 1991 is about 603,000 jobs. This represents less than one-half of one percent of the total civilian labor force in the United States--too small to have a significant national effect. There could be some specific cases of industrial and regional employment and price changes influenced by NASA expenditures.

The most significant economic effects of NASA spending is the long-run productivity advance from new technologies developed for the space and aeronautics programs. Many NASA-sponsored advances in air and space transportation, communications satellites, remote sensing satellites, and other innovations have improved the pro- ductive capacity of industry and stimulated the development and growth of many new businesses.

NASA is actively pursuing its role to expand the opportunities for private industry to gain access into space effectively and eco- nomically use space for commercial ventures. These expanded busi- ness opportunities have stimulated and are expected to continue to stimulate more productive, noninflationary private sector economic growth, job creation and improve the United States competitive economic position in the world, e.g., improve United States trade balance.

QUESTION 7

Please submit full documentation of NASA's reimbursable obligations, by major program for FY 1990, 1991, 1992, and identify the source of these reimbursements. This documentation should be at the same level of detail as is provided within the NASA budget request for directly funded programs.

F92REIM

NATIONAL AERONAUTICS & SPACE ADMINISTRATION
FY 1992 BUDGET
REIMBURSABLE SUMMARY
(Millions of Dollars)

	FY 1990	FY 1991	FY 1992
RESEARCH & DEVELOPMENT	665.0	539.8	613.8
SPACE STATION	0.2	0.4	0.2
SPACE TRANSPORTATION CAPABILITY DEV	92.0	82.1	109.8
DOD	79.4	64.6	93.1
NOAA	1.9	2.1	2.2
Other Federal	3.2	3.8	3.9
Non-Federal	7.5	11.6	10.6
SPACE SCIENCE & APPLICATIONS	457.2	351.2	415.8
PHYSICS & ASTRONOMY	9.4	8.3	5.0
DOD	4.6	3.5	3.6
Non-Federal	4.8	4.8	1.4
LIFE SCIENCES	0.4		
PLANETARY EXPLORATION	1.8		
DOD	1.7		
Non-Federal	0.1		
SPACE APPLICATIONS	445.6	342.9	410.8
DOD	310.4	203.6	249.8
NOAA	119.3	130.0	154.3
Other Federal	13.9	8.1	5.7
Non-Federal	2.0	1.2	1.0
COMMERCIAL PROGRAMS	3.6	3.7	3.7
DOD	2.3	2.4	2.3
Other Federal	0.8	0.8	0.8
Non-Federal	0.5	0.5	0.6
AERONAUTICAL RESEARCH & TECHNOLOGY	68.1	58.1	46.7
DOD	52.3	41.9	32.4
Other Federal	15.4	15.9	14.0
Non-Federal	0.4	0.3	0.3
SPACE RESEARCH & TECHNOLOGY	23.0	22.1	18.4
DOD	17.6	16.0	12.6
Department of Energy	4.5	5.1	4.6
Other Federal	0.8	1.0	1.2
Non-Federal	0.1		
TRANSATMOSPHERIC RESEARCH & TECHNOLOGY	2.6	3.0	3.7
ACADEMIC PROGRAMS	0.5	0.4	0.4
SAFETY, RELIABILITY & QUALITY ASSURANCE	0.8	0.8	0.9
ENERGY TECHNOLOGY	17.0	18.0	14.2

	FY 1990	FY 1991	FY 1992
SPACE FLIGHT, CONTROL & DATA COMMUNICATIONS	189.3	226.5	296.4
SHUTTLE PRODUCTION & CAPABILITY DEVELOPMENT	81.4	31.4	16.1
DOD	81.0	31.3	16.1
Other Federal	0.4	0.1	
SHUTTLE OPERATIONS	0.1	32.9	106.6
DOD	0.1		
Non-Federal		32.9	106.6
EXPENDABLE LAUNCH VEHICLES	64.6	95.1	104.4
DOD	14.1	4.4	4.5
NOAA	48.6	75.7	81.9
Other Federal	0.5	1.2	
Non-Federal	1.4	13.8	18.0
SPACE & GROUND NETWORK, COMMUNICATIONS & DATA SYSTEMS	43.2	67.1	69.3
DOD	29.3	43.0	48.8
NOAA	8.7	9.0	5.5
Non-Federal	5.2	15.1	15.0

QUESTION 8

Please provide an estimate of planned reimbursements from the Department of Defense for the provision of Space Shuttle services and schedule for such services for fiscal years 1991 through 1994.

QUESTION 9

Please provide a summary of contracts and amount of such contracts entered into with foreign entities for fiscal years 1991 through 1993.

NEW CONTRACTS WITH FOREIGN ENTITIES AWARDED IN FISCAL YEAR 1990

COUNTRY	CONTRACTOR	CONTRACT NUMBER	ESTIMATED VALUE (THOUSANDS)
	DESCRIPTION		
AUSTRAILIA	AUSTRAILIAN NATIONAL UNIV CONDUCT AND ANALYSIS SHOCK TUNNEL TESTS OF FLIGHT EXPERIMENT CONFIGURATION	NASW 4411	55
CANADA	CANADIAN COMMERCIAL CORP. A/E SERVICES FOR PRELIMINARY ENGINEERING STUDY FOR IMPROVING FLOW QUALITY AND REDUCING MAIN DR. SUPP	NAS 1 19037	486
	CANADIAN COMMERCIAL CORP. AE SERVICES FOR FINAL DESIGN OF MOD. TO UPGRADE 20 BY 60 FT. TUNNEL, BUILDING 643	NAS 1 19140	413
	CANADIAN COMMERCIAL CORP. BLACK BRANT V MOTOR ASSEMBLIES	NAS 5 30977	9,134
	NATL. RESEARCH COUNCL CAN	NASW 4401	211
ENGLAND	ERA TECHNOLOGY LTD DOPPLER RADAR ANTENNA SYSTEMS	NAS 5 30786	42
	AUTOMATED SYSTEMS LABS LTD	NAS13 417	54

QUESTION 10

Please provide the following information with regard to support contractors:

a. The number of employees of support contractors by center.
b. The associated employee cost by center.

The estimated R&PM funded support service contract workyears and cost by center is:

SUPPORT SERVICE CONTRACTORS
FY 1992

	Number of Employees (Equiv. Workyears)	Employee Cost ($K)
Johnson Space Center	1,453	76,568
Kennedy Space Center	1,973	124,499
Marshall Space Flight Center	627	34,551
Stennis Space Center	198	9,212
Ames Research Center	575	30,505
Langley Research Center	512	21,687
Lewis Research Center	654	42,346
Goddard Space Flight Center	862	37,652
NASA Headquarters	819	64,660
Total	7,673	441,680

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
FY92 CONGRESSIONAL BUDGET
PLANNED SHUTTLE REIMBURSEMENTS - DOD

	FY90	FY91	FY92	FY93	FY94
Planned Shuttle Flights (equivalent)	2.0	2.0	3.0	1.0	0.3
Application of prior flight credits \1	-2.0	-2.0	-3.0	-1.0	-0.3
Shuttle flights for reimbursements	0.0	0.0	0.0	0.0	0.0
Reimbursements (RY$)	0.0	0.0	0.0	0.0	0.0

1/ Represents 9 flights paid for with only 4 used through FY 1990

QUESTION 11

Please tabulate, by center, the research and program management funds to be used for repair and maintenance of facilities in FY 1991 and FY 1992.

The Research and Program Management funds to be used for repair and maintenance of facilities in FY 1991 and FY 1992 are below:

R&PM FUNDED MAINTENANCE EXPENDITURES
($K)

	FY 1991	FY 1992
Johnson Space Center	12,953	15,868
Kennedy Space Center	27,738	29,885
Marshall Space Flight Center	7,343	9,008
Stennis Space Center	1,954	1,815
Ames Research Center	7,107	12,088
Langley Research Center	4,482	5,636
Lewis Research Center	8,422	10,376
Goddard Space Flight Center	8,422	10,418
NASA Headquarters	19,401	26,814
Total	97,862	121,899

Funds are used for the repair and maintenance of facilities at NASA field centers and government-owned facilities, to include the day to day maintenance and more substantial repair of utility systems, the interior and exterior of general purpose (office) and technical buildings, and structures, pavement, and drainage systems.

QUESTION 12

Please provide a listing of actions taken pursuant to authorities provided by sections 103(a)(3)(MM), (NN), and (OO) of P.L. 101-611 relating to repair, rehabilitation, and minor facility renovation.

ENCLOSURE

1/14/91

R E P A I R
(K $'S)

CENTER/PROJECT	AMOUNT
AMES RESEARCH CENTER	
REPAIR OF ROOFS (N-207, N-213, & N-237)	420
REPAIR OF PRESSURE SYSTEMS, VARIOUS LOCATIONS	740
REPAIR OF ARC JET WATER SYSTEM (N234A)	570
REPAIR OF NATURAL GAS DISTRIBUTION SYSTEM	440
REPAIR OIL CIRCUIT BREAKERS, 14-FT. PRESSURE WIND TUNNEL	570
DRYDEN FLIGHT RESEARCH FACILITY	
REPAIR OF NATURAL GAS DISTRIBUTION SYSTEM	540
REPAIR OF ROADS/PAVING	150
GODDARD SPACE FLIGHT CENTER	
REPAIR AIR HANDLING UNITS, VARIOUS BUILDINGS	700
REPAIR ROOFS, VARIOUS BUILDINGS	570
REPAIR OF ELECTRICAL SYSTEMS, VARIOUS BUILDINGS	650
REPAIR OF INTERIOR SYSTEMS, BUILDINGS 1 AND 2	390
REPAIR GASEOUS NITROGEN SYSTEM, BUILDING 7/10	420
REPAIR PAVED SURFACES	250
JET PROPULSION LABORATORY	
REPAIR EARTHQUAKE DAMAGE, TELECOMMUNICATIONS BLDG (238)	720
REPAIR RESTROOMS, CONTROL SYSTEMS LABORATORY (198)	240
REPAIR PAVING, EXPLORER ROAD	500
REPAIR ROADS, EDWARDS TEST STATION	400
JOHNSON SPACE CENTER	
REPLACE CENTRAL FIRE ALARM AND SECURITY SYSTEM	720
REPAIR MANNED TEST SUPPORT SYSTEMS FOR CHAMBER A(32)	380
REPAIR 15 KV POWER CABLE, UTILITY TUNNEL SYSTEM	530
REPAIR SITE ROOFS, WHITE SANDS TEST FACILITY	630
REPAIR ROOFS, BUILDINGS 17 AND 45	300
KENNEDY SPACE CENTER	
REPLACE HIGH TEMPERATURE HOT WATER BOILER #3 AT VERTICAL ASSEMBLY BUILDING UTILITY ANNEX	485
REPLACE 450-TON CHILLERS, BUILDING M6-399	690
REPAIR LAUNCH COMPLEX 39 PAD A COMPRESSED AIR SYSTEM	500
REPL OPERATIONS & CHECKOUT BLDG HIGH BAY ROOF (M7-0355)	410
REPLACE ROOF SYSTEM, KSC HEADQUARTERS BUILDING	410
REPLACE AIR HANDLERS, DUCTS, PIPING, VERTICAL PROCESSING FACILITY (M71467)	730
REPAIR NASA PARKWAY	400
REPAIR HANGAR AM ROOF, EXTERIOR WALL, AND DOORS	150

REPAIR (CONT'D)

LANGLEY RESEARCH CENTER	
REPAIRS TO HIGH PRESSURE SYSTEMS, VAR FAC, WEST AREA	650
REPAIRS TO LIQUID RHEOSTAT, 14X22-FT SUBSONIC WIND TUNNEL (1212C)	320
REPAIRS TO HIGH PRESSURE SYSTEMS, VAR FAC, EAST AREA	500
REPAIR TO THE AIRCRAFT LANDING DYNAMICS FAC (1258/1258A)	720
REPAIR PROCESS COOLING WATER SYSTEMS, VARIOUS FACILITIES	580
REPLACE COOLING TOWER SERVING THE 8-FT TRANSONIC TUNNEL	640
REPLACE AIR-CONDITIONING SYSTEM, SUBSONIC TUNNELS OFFICE	150
REPAIRS TO ENCAPSULATE CEMENT ASBESTOS ROOF AND WALL PANEL	300
LEWIS RESEARCH CENTER	
REPAIR STEAM TRENCHES, TAYLOR ROAD	500
REPAIR CHILLED WATER PIPING, ENGINE RESEARCH BUILDING	530
REPAIR ELECTRIC POWER DISTRIBUTION TUNNEL	550
REPAIR HVAC, BASIC MATERIALS LABORATORY (106)	680
REPAIR HVAC, ENERGY CONVERSION LABORATORY (302)	720
REPAIR FIRE WATER DISTRIBUTION SYST, PLUM BROOK STATION	680
MARSHALL SPACE FLIGHT CENTER	
REPAIR HIGH PRESSURE PIPING	730
REPAIR ROADS AND PAVED AREAS	460
REPAIR COMPUTER AIR HANDLING UNIT (SCC)	335
MICHOUD ASSEMBLY FACILITY	
REPAIR BUILDING 102, FIRST FLOOR, WEST END	810
REPAIR BUILDING 101, SECOND FLOOR, WEST END	710
REPAIR DEMINERALIZED WATER SUPPLY LINE	390
REPAIR AIR HANDLING UNITS, ENCLOSED AREAS, BUILDING 103	460
STENNIS SPACE CENTER	
CANAL AND WATERWAY SYSTEM REPAIRS	380
REPLACE VARIOUS ROOFS	650
REPAIR OF ROADS	400
WALLOPS FLIGHT FACILITY	
REPAIR OF SEAWALL	700
RFPAIR OF ISLAND CAUSEWAY BRIDGE	675
REPAIR OF AIRCRAFT APRONS	525
VARIOUS LOCATIONS	
REPAIR ROOFS, MERRITT ISLAND STDN STATION, FL	200
REPAIR UTILITY SYSTEMS, BERMUDA STDN STATION	300
REPAIR OF ROOFS, MADRID, SPAIN	150
TOTAL.....	30,000

1/14/91

REHABILITATION & MODIFICATION

CENTER/PROJECT	AMOUNT
AMES RESEARCH CENTER	
REHAB & MOD OF THE FIRE SUPPRESION SYSTEM (N-221)	400
REHAB & MOD OF UTILITY SYSTEMS (N-243)	740
MOD OF SHOP AND OFFICE AREAS (N257)	470
REPLACEMENT OF POWER TRANSFORMER (T90)	740
MOD OF THE MAIN SUBSTATION TIE BREAKER	390
MODIFY STREET LIGHTING	150
DRYDEN FLIGHT RESEARCH FACILITY	
REHAB, AIR CONDITIONING SYSTEM, BLDG 4800 - AREA B	740
BACKUP POWER SYSTEM (4720)	400
MODIFY CAFETERIA PATIO AREA	140
GODDARD SPACE FLIGHT CENTER	
MODS FOR OFFICE, WAREHOUSING AND SUPPORT SPACE, VAR BLDGS	630
MODS TO TECHNICAL SUPPORT BUILDING (19)	500
MODS FOR LAUNCH SUPPORT ACTIVITIES IN SPACE SCIENCES LAB (	315
MODS OF FIRE PROTECTION SYSTEMS, VAR LOCATIONS	700
MODS TO OPTICAL TEST FACILITY, BUILDING (5)	300
REHAB & MOD OF DATA INTERPRETATION LABORATORY (23)	700
JET PROPULSION LABORATORY	
MODS TO ELECTRICAL SYS, COMPUTER PROGRAM OFFICE (156)	300
MODS TO WIND TUNNEL BUILDING (79)	700
JOHNSON SPACE CENTER	
MODS FOR CREW TRAINING	700
REHAB OF MASS SPECTROMETER CHEMICAL LAB (31)	550
MODS FOR FIRE SAFETY (45)	650
INSTALLATION OF AUTOMATIC-SPRINKLER SYSTEM (31)	450
REHAB OF FIRE DETECTION ALARM SYS (001) NASA IND PL	350
MODIFY PUBLIC AFFAIRS FACILITY (2)	250
INSTALL UTILITY AIR SYSTEMS COMPRESSOR (28)	450
KENNEDY SPACE CENTER	
REHAB BRIDGES ELECTRICAL CONTROL SYSTEMS	590
UPGRADE RAILROAD MAINLINE AND RAILROAD BRIDGE TO JJ YARD	715
REFURBISH GROUND AND ELEVATED WATER STORAGE TANKS	350
MODIFY AIR COND CTRL SYS, OPERATIONS & CHECKOUT (O&C)BLD	340
MODIFY LC-39 EMERGENCY POWER GENERATION PLANT	550
REHAB PAD B FIRE DETECTION, ALARM, AND REPORTING SYS	525
REFURBISH WATER CHILLER #3, VAB UTILITY ANNEX	380

REHABILITATION AND MODIFICATION (CONT'D)

LANGLEY RESEARCH CENTER	
MODS TO THE MACH 6 AND MACH 8 AIR DIST. SYS	700
MODS TO HYPERSONIC NITROGEN TUNNEL	610
MOD TO SPACECRAFT COMPONENTS LABORATORY (1239A)	720
REHAB, SIMULATION RESEARCH FACILITY (1250)	680
MOD TO THE 20-INCH SUPERSONIC WIND TUNNEL (1247D)	730
LEWIS RESEARCH CENTER	
REHAB OF LN2 SYS, SPACE POWER FACILITY (SPF), PLUM BROOK	720
MOD FOR ADVANCED DYNAMIC POWER FAC, ENG RESEARCH BLDG (5)	740
MODS FOR RESEARCH TEST CHAMBER, EPRB (16)	680
MODS TO 2.4 KV SWITCHGEAR, SUB B (13)	720
REHAB OF MECHANICAL SYSTEMS, ZERO-G FAC (110)	700
MARSHALL SPACE FLIGHT CENTER	
MODS FOR MARSHALL AVIONICS SYSTEMS TEST BED	715
MODS TO SUNSPOT PUMPING SYSTEM	350
MODS FOR AXAF OPERATIONS CONTROL CENTER	730
MODS TO SECURITY HEADQUARTERS	740
MODS OF DEIONIZED WATER SYSTEM, 4700 AREA	500
REHAB PLATING AREA AND CHEMICAL LABORATORY(4760)	740
MODS TO ENVIRONMENTAL TEST FACILITY	980
MICHOUD ASSEMBLY FACILITY	
MODIFY FOR CHECK VALVES IN MAIN FIRE SYSTEM	270
REHAB STEAM SUPPLY SYSTEM	550
REHAB AND MODIFY CHILLED WATER SYSTEM	740
REHAB AND MODIFY COOLING TOWER	310
STENNIS SPACE CENTER	
REHAB OF THE STIFFLEG DERRICK - B TEST STAND	750
MOD HIGH TEMP HOT WATER GENERATING SYS, SOUTH ADMIN AREA	750
REHAB CRYOGENIC AND HIGH PRESSURE GAS PIPING	370
REHAB CAFETERIA KITCHEN, BUILDING 1100	630
REPLACEMENT OF "B" COMPLEX MAIN GH2 VENT LINE	340
WALLOPS FLIGHT FACILITY	
MODS FOR CONTROL CENTER SUPPORT	740
MODS FOR FIRE PROTECTION, VARIOUS BUILDINGS	400
REHAB AND MOD OF TELESCOPE BUILDING (U-40)	745
VARIOUS LOCATIONS	
MOD OF AIR CONDITIONING SYS, VAR BLDGS, GOLDSTONE, CA	275
MOD OF POWERHOUSE, MARS SITE, GOLDSTONE, CA	210
MODS OF PERIMETER ROAD, MADRID, SPAIN	145
TOTAL.....	34,000

1/14/91

MINOR CONSTRUCTION
(K $'S)

CENTER/PROJECT	AMOUNT
AMES RESEARCH CENTER	
CONSTRUCT OFFICE, SPACE SCIENCE RESEARCH LAB (N-245)	490
DRYDEN FLIGHT RESEARCH FACILITY	
CONSTRUCTION OF AUDIO/VIDEO SUPPORT CENTER	490
GODDARD SPACE FLIGHT CENTER	
CONSTRUCTION OF TRUCK LOCK/STAGING FACILITY, BLDG 5	420
JET PROPULSION LABORATORY	
CONSTRUCT STORMWATER DRAINAGE FREQUENCY STANDARDS LAB	350
CONSTUCTION OF ADDN TO TABLE MOUNTAIN ADMIN BLDG (TM-17)	490
JOHNSON SPACE CENTER	
CONSTRUCT HYPERVELOCITY TEST ENCLOSURE, WSTF	490
CONSTRUCT ADDITION TO EMERGENCY CENTER BLDG, WSTF	450
KENNEDY SPACE CENTER	
CONSTRUCT ADDN TO OCCUPATIONAL HEALTH FAC	479
CONSTRUCT ROAD TO VEHICLE ASSEMBLY BLDG (VAB) SOLID ROCKET MOTOR SEGMENTS	136
CONSTRUCT ENVIRONMENTAL HEALTH FACILITY ANNEX	360
CONSTRUCT BANANA CREEK VIEWING SITE	490
LANGLEY RESEARCH CENTER	
CONSTRUCT AIRCRAFT ACOUSTICS RESEARCH FAC ADDN (1208)	490
CONSTRUCT NDE TESTING/ULTRASONIC CLEANING ADDITION (1296)	440
CONSTRUCT LOW-SPEED AERODYNAMICS RESEARCH TUNNEL LAB	490
LEWIS RESEARCH CENTER	
CONSTRUCTION OF ADDITION, BUILDING (309)	490
CONSTRUCTION OF SECURE BUILDUP AREA, BUILDING (102)	490
MARSHALL SPACE FLIGHT CENTER	
CONSTRUCT ADDITION TO FLAMMABILITY TEST FACILITY	470
CONSTRUCT ADDITION TO COMPUTED TOMOGRAPHY CONTROL ROOM	300
CONSTRUCT RADIOGRAPHIC INSPECTION CELL	360

MINOR CONSTRUCTION (CONT'D)

MICHOUD ASSEMBLY FACILITY	
CONSTRUCT SHELTER FOR EQUIPMENT/MATERIAL STORAGE	440
STENNIS SPACE CENTER	
ADDITION TO STANDARDS AND CALIBRATION LABORATORY	420
CONSTRUCT TECHNICAL SUPPORT AND ENGINEERING FACILITY	490
WALLOPS FLIGHT FACILITY	
CONSTRUCTION OF ADDN TO TEST/EVALUATION FACILITY (F-10)	515
VARIOUS LOCATIONS	
CONSTRUCTION OF LOGISTICS BLDGS, MARS SITE, GOLDSTONE,CA	470
CONST OF LOGISTICS ADDN TO OPERATIONS BLDG, CANBERRA	490
TOTAL.....	11,000

National Aeronautics and
Space Administration

Washington, D C
20546

Office of the Administrator

FEB 27 9

Honorable George E. Brown, Jr.
Chairman
Committee on Science, Space
and Technology
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

Submitted herewith is a draft bill, "To authorize appropriations to the National Aeronautics and Space Administration for research and development; space flight, control and data communications; construction of facilities; research and program management; and Inspector General; and for other purposes," together with the sectional analysis thereof.

Section 4 of the Act of June 15, 1959, 73 Stat. 75 (42 U.S.C. 2460), provides that no appropriation may be made to the National Aeronautics and Space Administration unless previously authorized by legislation. It is a purpose of the enclosed bill to provide such requisite authorization in the amounts and for the purposes recommended in the President's budget for FY 1992. For that fiscal year the bill would authorize appropriations totaling $15,753,999,796, to be made to the National Aeronautics and Space Administration as follows:

(1) for "Research and development," amounts totaling $7,198,500,000;

(2) for "Space flight, control and data communications," $5,608,299,796;

(3) for "Construction of facilities," amounts totaling $480,300,000;

(4) for "Research and program management," $2,452,300,000; and

(5) for "Inspector General," $14,600,000.

The bill includes new legislative language in Title II which would amend the National Aeronautics and Space Act to allow the Administration to withhold for a five-year period certain information which results from activities conducted by NASA under Space Act Agreements.

Finally, the last section of the draft bill provides that the bill, upon enactment, may be cited as the "National Aeronautics and Space Administration Authorization Act, 1992."

Where required by Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4332(2)(C)), and the implementing regulations of the Council on Environmental Quality, environmental impact statements covering NASA installations and the programs to be funded pursuant to this bill have been or will be furnished to the House Committee on Science, Space and Technology as appropriate.

The Office of Management and Budget advises that there is no objection to the presentation of this proposal to Congress, and its enactment would be in accord with the program of the President.

Sincerely,

Richard H. Truly
Administrator

2 Enclosures

cc:
Honorable Robert Walker

A BILL

To authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, and research and program management, and Inspector General, and for other purposes.

TITLE I--FISCAL YEAR 1992 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SEC. 101. That there is hereby authorized to be appropriated to the National Aeronautics and Space Administration to become available October 1, 1991:

(a) For "Research and development," for the following programs:

(1) Space Station Freedom, $2,028,900,000;

(2) Space transportation capability development, $879,800,000;

(3) Physics and astronomy, $1,140,600,000;

(4) Life sciences, $183,900,000;

(5) Planetary exploration, $627,300,000;

(6) Space applications, $982,800,000;

(7) Technology utilization, $32,000,000;

(8) Commercial use of space, $118,000,000;

(9) Aeronautical research and technology, $591,200,000;

(10) Transatmospheric research and technology, $72,000,000;

(11) Space research and technology, $421,800,000;

(12) Safety, reliability and quality assurance, $33,600,000;

(13) Tracking and data advanced systems, $22,000,000;

(14) Academic Programs, $64,600,000;

(b) For "Space flight, control and data communications," for the following programs:

(1) Space Shuttle production and operational capability, $1,288,900,000;

(2) Space transportation operations, $3,023,600,000;

(3) Expendable launch vehicles, $341,900,000;

(4) Space and ground network, communications and data systems, $953,899,796 of which $32,674,796 shall be used only for the purpose of reducing all outstanding debt to the Federal Financing Bank, for the Tracking and Data Relay Satellite System (TDRSS) loan;

(c) For "Construction of facilities," including land acquisition, as follows:

(1) Construction of Space Station Processing Facility, Kennedy Space Center, $35,000,000;

(2) Modification for Earthquake Protection, Downey/Palmdale, CA, Johnson Space Center, $4,400,000;

(3) Modifications for Safe Haven, Vehicle Assembly Building, High-Bay 2, Kennedy Space Center, $7,500,000;

(4) Rehabilitation of Crawlerway, Kennedy Space Center, $3,000,000;

(5) Restoration of Shuttle Landing Facility Shoulders, Kennedy Space Center, $4,000,000;

(6) Restoration of the High Pressure Gas Facility, Stennis Space Center, $6,500,000;

(7) Construction of Addition for Flight Training and Operations, Johnson Space Center, $13,000,000;

(8) Construction of Advanced Solid Rocket Motor Program Facilities (various locations), $150,000,000;

(9) Modernization of Industrial Area Chilled Water System, Kennedy Space Center, $4,000,000;

(10) Rehabilitation and Expansion of Communications Duct Banks, Kennedy Space Center, $1,400,000;

(11) Replace 15 KV Load Break Switches, Kennedy Space Center, $1,300,000;

(12) Repair Site Water System, White Sands Test Facility, $1,300,000;

(13) Replace Central Plant Chillers and Boiler, Johnson Space Center, $5,700,000;

(14) Modifications to X-Ray Calibration Facility (XRCF), Marshall Space Flight Center, $5,200,000;

(15) Restoration and Modernization of High Voltage Distribution System, Goddard Space Flight Center, $7,000,000;

(16) Construction of Earth Observing System Data Information System Facility, Goddard Space Flight Center, $17,000,000;

(17) Modernization of Main Electrical Substation, Jet Propulsion Laboratory, $5,500,000;

(18) Restoration of Utilities, Wallops Flight Facility, $3,500,000;

(19) Repair and Modernization of the 12-foot Pressure Wind Tunnel, Ames Research Center, $25,000,000;

(20) Upgrade of Outdoor Aerodynamic Research Facility, Ames Research Center, $3,300,000;

(21) Modernization of 16-foot Transonic Tunnel, Langley Research Center, $3,400,000;

(22) Modifications to the High Pressure Air System, Langley Research Center, $11,700,000;

(23) Rehabilitation of Central Air System, Lewis Research Center, $5,600,000;

(24) Rehabilitation of Icing Research Tunnel, Lewis Research Center, $2,600,000;

(25) Construction of Data Interface Facility, White Sands Test Facility, $4,000,000;

(26) Rehabilitation of Tracking and Data Relay Satellite System (TDRSS) Ground Terminal, White Sands Test Facility, $5,700,000;

(27) Repair of facilities at various locations, not in excess of $1,000,000 per project, $31,700,000;

(28) Rehabilitation and modification of facilities at various locations, not in excess of $1,000,000 per project, $34,800,000;

(29) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of $750,000 per project, $12,900,000;

(30) Environmental compliance and restoration, $36,000,000;

(31) Facility planning and design, not otherwise provided for, $34,000,000;

Because of changes to the Davis-Bacon Act, the total amount authorized for subsections (1) through (29) is reduced by $5,700,000.

(d) For "Research and program management," $2,452,300,000;

(e) For "Inspector General," $14,600,000;

(f) Notwithstanding the provisions of subsection 101(i), appropriations hereby authorized for "Research and development" and "Space flight, control and data communications" may be used (1) for any items of a capital nature (other than acquisition of land) which may be required at locations other than installations of the Administration for the performance of research and development contracts, and (2) for grants to nonprofit institutions of higher education, or to nonprofit organizations whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities; and title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Each such grant shall be made under such conditions as the Administrator shall determine to be required to ensure that the United States will receive therefrom benefit adequate to justify the making of that grant. None of the funds appropriated for "Research and development" and "Space flight, control and data communications" pursuant to this Act may be used in accordance with this subsection for the construction of any major facility, the estimated cost of which, including collateral equipment, exceeds $750,000, unless

the Administrator or the Administrator's designee has notified the Committee on Science, Space and Technology of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate, of the nature, location, and estimated cost of such facility.

(g) When so specified and to the extent provided in an appropriation Act, (1) any amount appropriated for "Research and development," for "Space flight, control and data communications" or for "Construction of facilities" may remain available without fiscal year limitation, and (2) contracts may be entered into under "Inspector General" and under "Research and program management" for maintenance and operation of facilities, and for other services to be provided, during the next fiscal year.

(h) Appropriations made pursuant to subsection 101(d) may be used, but not to exceed $35,000, for scientific consultations or extraordinary expenses upon the approval or authority of the Administrator, and his determination shall be final and conclusive upon the accounting officers of the Government.

(i)(1) Funds appropriated pursuant to subsections 101(a), (b), and (d) may be used for the construction of new facilities and additions to existing facilities, and for repair, rehabilitation, or modification of facilities, provided the cost of each such project, including collateral equipment, does not exceed $200,000.

(2) Funds appropriated pursuant to subsections 101(a) and (b) may be used for unforeseen programmatic facility project needs, provided the cost of each such project, including collateral equipment, does not exceed $750,000.

(3) Funds appropriated pursuant to subsection 101(d) may be used for repair, rehabilitation or modification of facilities controlled by the General Services Administration, provided the cost of each project, including collateral equipment, does not exceed $500,000.

Administrator's Reprogramming Authority

SEC. 102. Authorization is hereby granted whereby any of the amounts prescribed in paragraphs (1) through (31), inclusive, of subsection 101(c) --

(a) at the discretion of the Administrator or the Administrator's designee, may be varied upward 10 percent, or

(b) following a report by the Administrator or the Administrator's designee to the Committee on Science, Space and Technology of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate, on the circumstances of such action, may be varied upward 25 percent, to meet unusual cost variations.

The total cost of all work authorized under paragraphs (a) and (b) shall not exceed the total of the amounts specified in Section 101(c).

Special Reprogramming Authority for
Construction of Facilities

SEC. 103. Where the Administrator determines that new developments or scientific or engineering changes in the national program of aeronautical and space activities have occurred; and that such changes require the use of additional funds for the purposes of construction, expansion, or modification of facilities at any location; and that deferral of such action until the enactment of the next authorization Act would be inconsistent with the interest of the Nation in aeronautical and space activities; the Administrator may transfer not to exceed 1/2 of 1 percent of the funds appropriated pursuant to Section 101(a) and 101(b) to the "Construction of facilities" appropriation for such purposes. The Administrator may also use up to $10,000,000 of the amounts authorized under Section 101(c) for such purposes. The funds so made available pursuant to this section may be expended to acquire, construct, convert, rehabilitate, or install permanent or temporary public works, including land acquisition, site preparation, appurtenances, utilities, and equipment. No such funds may be obligated until a period of 30 days has passed after the Administrator or the Administrator's designee has transmitted to the Committee on Science, Space and Technology of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate a written report

describing the nature of the construction, its cost and the reasons therefor.

Limitations on Authority

SEC. 104. Notwithstanding any other provision of this Act-

(a) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science, Space and Technology or the Senate Committee on Commerce, Science and Transportation,

(b) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by subsections 101(a), 101(b) and 101(d),

(c) no amount appropriated pursuant to this Act may be used for any program which has not been presented to either such committee,

unless a period of 30 days has passed after the receipt by each such committee, of notice given by the Administrator or the Administrator's designee containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed action.

TITLE

SEC. 105. This Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1992."

TITLE II--AMENDMENT TO THE SPACE ACT ON PROTECTION OF INFORMATION DEVELOPED UNDER SPACE ACT AGREEMENTS

SEC. 201. Section 303 of the National Aeronautics and Space Act of 1958, as amended, is amended by adding "(a)" after "303", by removing "and" before "B,", and by adding after "national security" the following: ", and (C) information described in subsection (b), below." At the end of subsection 303(a), add the following new section:

(b) The Administrator, for a period of up to five years after the development of information that results from activities conducted under an agreement entered into under the authority of section 203(c)(5) and section 203(c)(6) of this Act, and that would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of section 552(b)(4) of Title 5, United States Code, if the information had been obtained from a non-Federal party participating in such an agreement, may provide appropriate protection against the dissemination of such information, including exemption from subchapter II of Chapter 5 of Title 5, United States Code.

SECTIONAL ANALYSIS
of a Bill

"To authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, research and program management, and Inspector General, and for other purposes."

SECTION 101

Subsections (a), (b), (c), (d), and (e) would authorize to be appropriated to the National Aeronautics and Space Administration, funds, in the total amount of $15,753,999,796 as follows: (a) for "Research and development," a total of 14 program line items aggregating the sum of $7,198,500,000; (b) for "Space flight, control and data communications," a total of 4 line items aggregating the sum of $5,608,299,796; (c) for "Construction of facilities," a total of 31 line items aggregating the sum of $480,300,000; (d) for "Research and program management," $2,452,300,000; and (e) for "Inspector General," $14,600,000.

Section 101(c) includes a reduction of $5,700,000 in facilities projects consistent with Administration proposals to make regulatory reforms under and legislative changes to the Davis-Bacon Act.

Subsection (f) would authorize the use of appropriations for "Research and development" and "Space flight, control and data communications" without regard to the provisions of subsection 101(i) for: (1) items of a capital nature (other than the acquisition of land) required at locations other than NASA installations for the performance of research and development

contracts; and (2) grants to nonprofit institutions of higher education, or to nonprofit organizations, whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities. Title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Moreover, each such grant shall be made under such conditions as the Administrator shall find necessary to ensure that the United States will receive benefit therefrom adequate to justify the making of that grant.

In either case, no funds may be used for construction of a facility in accordance with this subsection, the estimated cost of which, including collateral equipment, exceeds $750,000, unless the Administrator notifies the specified committees of the Congress, of the nature, location, and estimated cost of such facility.

Subsection (g) would provide that, when so specified and to the extent provided in an appropriation Act, any amount appropriated for "Research and development," "Space flight, control and data communications," or for "Construction of facilities" may remain available without fiscal year limitation. Subsection (2) states that amounts appropriated for the "Inspector General" and "Research and program management" appropriations are available for contracts for maintenance and operation of facilities and for other services for this fiscal year and for the next fiscal year.

Subsection (h) would authorize the use of not to exceed $35,000 of the "Research and program management" appropriation for scientific consultation or extraordinary expenses, including representation and official entertainment expenses, upon the authority of the Administrator, whose determination shall be final and conclusive.

Subsection (i)(1) would provide that of the funds appropriated for "Research and development, "Space flight, control and data communications," and "Research and program management," not in excess of $200,000 per project (including collateral equipment) may be used for construction of new facilities and additions to existing facilities, and for repair, rehabilitation, or modification of facilities.

Subsection (i)(2) would provide that not to exceed $750,000 per project of "Research and development" and "Space flight, control and data communications" funds may be used for facility repair or modification due to unforeseen programmatic needs.

Subsection (i)(3) would provide that not in excess of $500,000 per project (including collateral equipment) of funds appropriated for "Research and program management" may be used for work on facilities owned or leased by the General Services Administration.

SECTION 102 - Administrator's Reprogramming Authority

Section 102 would authorize upward variations of the sums authorized for the "Construction of facilities" line items of

10 percent at the discretion of the Administrator or the Administrator's designee, or of 25 percent following a report by the Administrator or the Administrator's designee to the Committee on Science, Space and Technology of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate on the circumstances of such action, for the purpose of meeting unusual cost variations. However, the total cost of all work authorized under these line items may not exceed the total sum authorized for "Construction of facilities" under subsection 101(c).

SECTION 103 Special Reprogramming Authority for Construction of Facilities

Section 103 would provide that not more than 1/2 of 1 percent of the funds appropriated for "Research and development" and "Space flight, control and data communications" may be transferred to and merged with the "Construction of facilities" appropriation, to be available for the construction of facilities and land acquisition at any location if the Administrator determines that new developments or scientific or engineering changes in the national aeronautical and space program have occurred; and that such changes require the use of additional funds for the purpose of construction, expansion or modification of facilities at any location; and that deferral of such action until the next authorization Act is enacted would be inconsistent with the interest of the Nation in aeronautical and space activities. Additionally, up to $10,000,000 of "Construction of facilities"

funds may be used for these purposes. However, no such funds may be obligated until 30 days have passed after the Administrator or the Administrator's designee has transmitted to the Committee on Science, Space and Technology of the House of Representatives and the Committee on Commerce, Science and Transportation of the Senate a written report containing a description of the construction, its cost, and the reasons therefor.

SECTION 104 Limitations on Authority

Section 104 would provide that, notwithstanding any other provision of this Act --

(a) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science, Space and Technology or the Senate Committee on Commerce, Science and Transportation,

(b) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by subsections 101(a), 101(b) and 101(d), and

(c) no amount appropriated pursuant to this Act may be used for any program which has not been presented to either such committee,

unless a period of 30 days has passed after the receipt by the House Committee on Science, Space and Technology and the Senate Committee on Commerce, Science, and Transportation of notice given by the Administrator or the Administrator's designee

containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed action.

SECTION 105 Title

Section 105 would provide that the Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1992."

TITLE II

AMENDMENT TO THE SPACE ACT ON PROTECTION OF INFORMATION DEVELOPED UNDER SPACE ACT AGREEMENTS

The purpose of Section 201 is to amend section 303 of the National Aeronautics and Space Act of 1958, as amended, to provide NASA with the authority to protect certain information, including withholding from public disclosure, resulting from research and development activities under an agreement entered into by NASA under section 203(c)(5) or section 203(c)(6) of such Act. The protection would be for a period of up to five years after the development of information, and would apply to any information that would be a trade secret or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of Title 5, United States Code, if obtained from a non-federal party participating in such agreements.

This authority is virtually the same (except for structural changes necessary to interface with the Space Act) as that

provided in section 3133(a)(7) of Public Law 101-189 for the protection of the same information as that resulting from agreements entered into under section 12 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a). The Congress, in providing such authority in Public Law 101-189, recognized that the lack of protection for such information was a significant reason for companies' reluctance to enter into cooperative research and development agreements with the Federal laboratories, and expressed a desire to make such agreements more effective instruments for cooperative research (Conference Report 101-331, November 7, 1989, accompanying H.R. 2461; discussion of Technology Transfer (secs. 3031-3133)).

NASA uses the authority provided in section 203(c)(5) or 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended, to enter into agreements that are virtually identical to, and produce the same results as, those authorized by section 12 of the Stevenson-Wydler Technology Innovation Act of 1980. The continuing use of such Space Act authority by NASA was expressly recognized in the House-Senate Conference Report for H.R. 3773 (which became Pub. L. 99-502 amending the Stevenson-Wydler Technology Innovation Act of 1980 to provide the section 12 authority therein) by the statement:

> This authority [to enter into cooperative research and development agreements] is optional in both [House and Senate] versions and is not intended to affect previously existing cooperative agreement authority, such as the Space Act provisions, which for almost three decades have permitted NASA laboratories to enter into cooperative agreements.

Thus, section 201 is intended to provide the same protection for the same type of information resulting from the same type of agreements entered into by NASA under its Space Act authority as those entered into by other agencies under the authority provided by section 12 of the Stevenson-Wydler Technology Innovation Act. This is in furtherance of the Congressional intent to make such agreements instruments for cooperative research, irrespective of the specific authority relied on in entering into such agreements.

No additional protection is sought for information obtained from a non-federal party participating in such agreements (as distinguished from information resulting from NASA's activities under the agreement) in that adequate protection is considered to exist under subsection (b)(4) of 5 U.S.C. 552 for such information.

MATERIAL PROVIDED TO THE COMMITTEE IN SUPPORT

OF THE DEPARTMENT OF TRANSPORTATION REQUEST

OPERATIONS AND RESEARCH--OCST February 25, 1991

OFFICE OF COMMERCIAL SPACE TRANSPORTATION (OCST)

(Dollars in thousands)

OCST	FY 1990 Actual[1]	FY 1991 Estimate	FY 1992 Estimate	Difference
Permanent Positions	27	24	28	+4
Full-Time Equivalents	19	23	25	+2
Personnel Compensation and Benefits	$1,050	$1,286	$1,506	$+220
Travel	$ 71	$ 60	$ 98	$ +38
Research and Safety Program	$2,940	$2,340	$3,500	$+1,160
Total	$4,061	$3,686[2]	$5,104[2]	$+1,418

[1] Combined total of resources in OCST Salaries and Expenses and TPR&D.

[2] Assumes $300,000 received from user fees.

The duties of the Office of Commercial Space Transportation are to carry out the Department's responsibilities defined in the Commercial Space Launch Act, as amended; Executive Order 12465; and the National Security Decision Directive on National Space Policy. These responsibilities include encouraging, facilitating, and promoting U.S. private sector commercial space launch activities and regulating such activities to protect public safety and other important national interests. The 1990 amendments to the Commercial Space Launch Act expanded the Department's role in facilitating the strengthening and expansion of U.S. space transportation infrastructure, as well as launch site support facilities, including the promotion of public-private partnerships involving the Federal Government, State governments, and the private sector to build, expand, modernize, or operate space launch infrastructure. OCST supports the Secretary in his role as the President's principal advisor and spokesman on Federal commercial space transportation policy.

The Office of Commercial Space Transportation (OCST) is committed to the goal of ensuring a substantial commercial space transportation industry that is safe, reliable, and internationally competitive. This goal, along with OCST programs and initiatives, goes hand-in-hand with the major themes outlined in the Statement of National Transportation Policy (NTP).

The Office of Commercial Space Transportation in the Department of Transportation is the government office mandated by law and administrative action with overseeing and facilitating the U.S. commercial space transportation industry. Commercial space transportation is a mode of transportation just as commercial aviation is a mode of transportation, with the former moving cargo to, through, and from space and the latter moving cargo and passengers from one point on the surface of the earth to another through the air. DOT's responsibilities for regulating and fostering this industry are comparable to its role for other transportation fields such as aviation, marine, and rail.

The roles of the other government agencies involved in space launches are different from that of DOT. The Department of Defense (DOD) uses space for national security purposes. Just as it owns and operates air fields and airplanes, it owns and operates space vehicle launch facilities and fleets of space vehicles. DOD has several relationships with the commercial launch industry. As a customer, DOD procures commercial launch services, as it did for some Strategic Defense Initiative Organization (SDIO) and Navy UHF launches (launches which are regulated by DOT). As an owner and operator of launch facilities, DOD provides reimbursable support for commercial launches. Similarly, the National Aeronautics and Space Administration (NASA) uses space vehicles for research and exploration on the part of the Government and for technological development which may later benefit the commercial space industry just as their aeronautical research benefits commercial aviation. Like the Department of Defense, NASA also owns and operates various launch facilities along with some launch vehicles, notably the Space Shuttles.

OCST is composed of three program divisions: Licensing Programs, Industry Policy and Planning, and Program Affairs. These three divisions work together to provide a licensing and regulatory framework to ensure public health and safety and guarantee that the national security and foreign policy interests of the U.S. are not violated during commercial space launch operations; and a policy that encourages continued development of the commercial space transportation industry; and the promotion of the opportunities afforded by commercial space as an industry.

Changes in Resources

A total of $1,506,000 is necessary in PC&B to fund 25 FTEs, to annualize the January 1991 pay raise, fund a proposed January 1992 pay raise at 4.2% and normal within-grade and merit pay increases. This is an increase of two FTE and $220,000 over the FY 1991 enacted budget. The requested staff will support the commensurate increase in licensing, monitoring, enforcement, and policy activities.

An increase of $38,000 over the travel requirements in FY 1991, for a total of $98,000, is requested for travel. The ability of

OCST to assure the protection of public safety is dependent on an adequate travel budget to meet the busy anticipated launch schedule. Inspections of operations at existing launch facilities, operations centers, and company headquarters will continue to constitute at least a quarter of OCST travel. Because industry activities have broadened and diversified, many other activities including environmental studies, safety assessments, site evaluations, data collection initiatives, public speaking engagements, state and local planning sessions, and participation in major space conferences and policy decision forums, as well as support for agreements with foreign partners, drive OCST travel requirements.

In FY 1990, OCST travel was comprised largely of trips for compliance monitoring activities, safety studies, and commercial space transportation development. Both in FY 1989 and FY 1990, it was necessary to transfer up to $10,000 in funds from personnel compensation and benefits to perform the necessary travel. Greater commercial space transportation activity will make increased travel necessary to carry out the broad regulatory responsibilities anticipated in FY 1992. Launch delays often result in the need for additional trips to ensure adequate compliance monitoring of launch activities. The geographic remoteness of space launch sites used for commercial launches, such as Kwajalein, also imposes major travel burdens. Current activity at any individual site has not reached the critical amount required to make the creation of a field office less costly than travel.

A total of $3,200,000 for the Research and Safety Program is requested, to be supplemented with $300,000 in user fee collections. The following is a break-down of program requirements by category:

A. SAFETY OPERATIONS $925

Objectives: To protect public health and safety as mandated by Congress in the Commercial Space Launch Act and amendments through regulation and licensing of launch operations and sites, the monitoring of activities to ensure compliance with established regulations and license requirements, enforcement, and the issuance of insurance requirements, in a manner which ensures high levels of public safety while permitting innovation and growth in the United States space industry and to provide support for the administration of OCST licensing, inspection and enforcement program and for the formulation and management of the research program.

Accomplishments:

Under the regulatory oversight of the Office of Commercial Space Transportation (OCST), the U.S. commercial launch industry has grown both in terms of the amount of activity and the complexity of ventures undertaken or planned.

During FY 1989, OCST received 9 applications and issued 4 licenses for a total of 4 launches. In FY 1990, OCST received 10 applications, for which the licenses issued authorized 16 launches. Several of these licenses were for new on-orbit, space applications.

Eleven commercial launch attempts (including 8 successful and 3 unsuccessful launches) were made in FY 1990. The U.S. Commercial Launch Manifest, as of January 1991, shows a total of 35 launches already booked for the next several years.

OCST completed a safety study of the two Hawaiian proposed sites and reviewed its launch site master plans from a safety perspective.

Increased launch activity has spread out over more launch sites including Cape Canaveral, White Sands, Barking Sands, Kwajalein, and Wallops Island. OCST is studying proposed reentry vehicle landing sites at White Sands, New Mexico, and other states.

OCST issued three new design "operating" licenses and issued regulations on its licensing process.

OCST completed a safety assessment of a payload processing facility in Florida that addressed local concerns.

OCST participated in 4 investigations of incidents or accidents in FY 1990. Accident investigation plans were revised to reflect the memorandum of understanding with the National Transportation Safety Board (NTSB).

OCST has started working with the reentry vehicle operator for the COMET program to certify the reentry vehicle and license the operators flight program.

OCST developed computerized information systems for tracking of license, launch, and compliance monitoring activities and to provide the ability to cross-reference key factors. OCST continued to add a large body of new information to its database on space transportation safety, including data on space accidents, to assess risk and identify potential safety problems.

Total Cost To Date: $1,785

FY 1990 & FY 1991 Costs: $1,010 & $775

FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
$925	$925	$925	$925	$925

1. Licensing Operations ($450)

The workload of the Office has increased with changes in the industry. The review and approval of launches of new vehicles such as air-launched systems, reentry vehicles, and commercial

launch site proposals are more complex than the proposals to launch existing designs from Cape Canaveral. The licensing process is being redesigned and improved in order to enable OCST to handle growing levels of commercial launch activity and increasingly complex initiatives in an efficient manner. Indeed, these improvements, which will result in the licensing of certain classes of space transportation activities under a launch operator's license, will broaden the scope of the license review. At the same time, the complexity presented by new and varied commercial launch systems and space applications, the inclusion of on-orbit activities, and the substitution of commercial operations and launch facilities for established Government-controlled operations and facilities will continue to increase, and require that additional technical resources be expended during the review process. As individual states such as Hawaii, Mississippi, and others request safety evaluations of their sites to determine licensability, these evaluations place new resource and technical demands on OCST's engineering staff. Resources will be used for technical consultants who support the office staff's technical review and analysis to evaluate the systems safety plans contained in the license applications and to provide data and input to the Office's risk analysis of proposed activities.

2. Inspection Requirements ($325)

The modification of the licensing process to include programs of launches under one license will result in more of OCST's resources being devoted to compliance monitoring to ensure that the requirements of the licenses are met. By taking the opportunity to inspect as many launch vehicles, payloads, operations, and facilities as possible on a single inspection trip, the inspection process is designed to operate as efficiently as possible. Yet, the emergence of new launch systems and commercial ranges, coupled with inevitable last minute launch delays, will drive the need for inspection trips. The advent of commercial launch and reentry facilities will require major revisions to OCST compliance monitoring protocol. OCST will continue to utilize contractor support to supplement its staff, and arrange interagency support, where appropriate, to conduct these inspections. With the launch activity in FY 1992 expanding to additional locations spread across the U.S. and its territories, on-site inspection will create major logistical problems.

3. Accident/Incident Investigation Support ($75)

The National Transportation Safety Board (NTSB) will be the lead investigating organization in most commercial launch accidents affecting public safety with OCST assuming lead responsibility for investigating incidents. At a minimum, OCST monitors the progress of the investigations of occurrences which did not, but could conceivably, affect public safety. As new vehicle designs, new companies, commercial launch ranges, and orbital reentry

vehicles appear and the number of launches increases, the likelihood of situations requiring investigation also increases. As a gauge for the number of these type of events, six prelaunch and launch incident/failures occurred between May 1989 and September 1990 that required OCST participation. Included were three mission failures with one resulting in the vehicle burning on the launch pad, another in premature separation of the payload from the launch vehicle, and another in the failure of the payload to separate from the orbiting second stage. There was a fatality to a worker during tower refurbishment, damage to a satellite on the launch pad, and damage to a vehicle during prelaunch testing. Funds are required, therefore, for OCST to continue to develop its procedures and guidance and to provide technical support for any investigation. In addition as part of the post license requirements, each licensee is required to submit its own incident/accident investigation plan which must be reviewed and approved by OCST prior to actual launches.

4. License, Inspection and Enforcement Information and Computer Systems ($75)

Increases in space transportation activities will bring more license applications, inspections, investigations and enforcement activities. These systems will be used to track and analyze license actions; inspections; violations resulting fines, license suspensions, and revocations; identify trends; and determine the most effective inspection and enforcement strategies. Funding is required for its operation and maintenance.

B. SAFETY PLANNING AND RESEARCH $1,675

Objectives: To establish the body of knowledge necessary to support the requirements of the Commercial Space Launch Act and amendments thereto; to develop effective and efficient safety standards and regulations; and to provide guidance to the commercial launch industry concerning regulatory aspects of new launch and payload concepts.

Accomplishments:

During FY 1991 based on its research, OCST is issuing regulations, certification procedures, and/or standards for commercial launch ranges and certain on-orbit activities.

In order to keep pace with a growing demand for licenses for launch and related operations, OCST shifted the focus of its licensing process from individual launches to longer-term launch programs by issuing three launch operator's licenses. This allows DOT to maintain a high level of safety while facilitating the licensing process, reducing the paperwork burden on the industry, reducing the number of applications handled by the office, and providing more efficient regulation of the complete spectrum of activities covered by the Commercial Space Launch Act.

In accordance with the Commercial Space Launch Act as amplified in the amendments of 1988, OCST has now set insurance requirements for at least 9 companies operating at seven or more different launch sites. OCST research documented and evaluated range safety personnel requirements and training at the various national ranges.

OCST and the State of Hawaii expect to complete a joint Environmental Impact Statement for the Hawaiian commercial launch facility.

OCST completed a study which identified safety factors for locating a launch site in Mississippi.

Relative to the outer space environment, OCST is studying options jointly with NASA and DOD for reducing orbital debris.

Total Cost To Date: $2,655

FY 1990 & 1991 Costs: $1,480 & $1,175

FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
$1,675	$1,675	$1,675	$1,675	$1,675

1. Commercial Infrastructure and Commercial Operations ($1,225)

The development of new vehicles, payloads, and infrastructure presents a challenge for an efficient regulatory program that ensures public safety while permitting innovation and international competitiveness of the American space launch industry. In addition, DOT also has a role in supporting and encouraging commercial participation and involvement in the U.S. Government joint launch architecture and infrastructure program.

The rapid growth in the number of launches and the development of new launch vehicle concepts and payloads, including reentry systems, has signalled the arrival of a commercial industry. Major launch companies continue to redesign their existing vehicles to increase their commercial effectiveness, incorporating advanced technologies. These systems are coming into service as quickly as companies can complete new designs. OCST is working with two companies which are developing vehicles to carry payloads with reentry capability for microgravity materials processing and biological experimentation. Companies developing reentry vehicles are seriously considering new, currently undeveloped, landing sites.

Insufficient capacity of national ranges for this increased activity has spawned state proposals to develop commercial launch infrastructure. Commercial launch sites are under consideration or development in Hawaii, Florida, and Mississippi; they have been discussed in states such as Alaska, Virginia, and Texas. OCST will have to identify issues and evaluate selected options

to ensure the safety of commercial launch sites. Texas is under consideration as a commercial landing site for the COMET reentry vehicle program, and such a site would be subject to DOT safety approval. Also, U.S. firms have been considering foreign sites in Mexico, Canada, Australia, and Kourou, and their operation at these facilities would require a DOT license under the Act. Considerations will include the requirement of the Commercial Space Launch Act, as amended, that industry's efforts should be encouraged and regulated only to the extent necessary to protect the public health and safety, the safety of property, and U.S. national security and foreign policy interests. In order to achieve safety in the most effective and efficient means possible, the interactions of various components of space transportation will be considered.

OCST expects that this area will be a major priority for Federal involvement for at least two years beyond FY 1992 with continual updating required as new launch systems, ranges, equipment, and payloads are developed and integrated into the existing and new launch infrastructure.

a. Commercial Operator Qualifications & Certification [$400]

The Department's work with the States of Hawaii and Florida and with companies developing reentry vehicles and air-launched vehicles provides strong signs that commercial companies will have operational control over factors affecting public safety that previously were the sole province of the Government. More operations will be computerized, changing the focus of personnel qualifications and the monitoring of operating procedures. New air launch systems such as Pegasus may not use a fixed range with its supporting safety infrastructure but instead incorporate necessary support in the delivery aircraft. It will be necessary to establish criteria for reentry site acceptability and necessary qualifications and certifications for operating personnel. In the context of other research concerning operations and hardware systems, range safety qualifications, standards, and certification procedures will be developed for commercial launches.

b. Evaluation Methodologies for Commercial Safety Practices [$300]

Based on state and company proposals to handle their own range safety, it is clear that commercial ranges under development will employ unique procedures. New types of vehicles and payloads, including reentry systems, will result in the need to consider safety-related operations and procedures over the entire space flight. An air-launch is likely to employ procedures quite different from those used on the ground. Air-launch platforms and other potential remote launch sites require different procedures than those

required for a launch from a site relatively close to population centers. The introduction of launch vehicles having different staging sequences affects range safety. Research will develop methodologies for evaluating the adequacy of commercial practices. Its scope is not confined to launch operations but also involves documenting and assessing the adequacy of on-orbit operational procedures, vehicle navigation, tracking, advanced orbital predictions of possible collisions, collision risk assessment systems, and reentry command and operating procedures.

c. Safety and Reliability of Hardware Systems [$275]

The adequate design and reliability of safety-related hardware systems is a fundamental element in protection of public health and property. The advent of new vehicles and launch facilities designed expressly for commercial use will result in hardware designed to achieve commercial goals, instead of experimental and military needs. Research will be directed at the requirements for telemetry and tracking for launch vehicles, reentry vehicles, and launch sites. It will examine innovations under development which provide greater on-board autonomy, including on-board computerized flight termination systems, used in conjunction with highly accurate on-board navigational systems and satellite-based tracking systems. Such technological advancements will affect personnel qualifications and operational procedures. OCST will consider these impacts in developing certification procedures and requirements for safety hardware.

d. Commercial Payload Safety [$250]

Many payloads contain toxic, radioactive, or other hazardous materials. DOT is responsible under Sec. 6. (b)(2) of the Commercial Space Launch Act to review certain types of payloads. In essence, Section 6 provides that payloads that are not U.S. Government payloads or not subject to existing FCC or NOAA regulation, must be reviewed by DOT to determine whether their launch would jeopardize public health and safety, safety of property or any U.S. national security or foreign policy interest.

Past space activity largely has been limited to communications, sensing, and surveillance. In addition to these activities, commercial endeavors will feature dynamic activities which demand safety regulation. Micro-gravity research, microbiological and pharmaceutical research, space manufacturing, energy production, the increased use of vehicles with active systems for reentry and recovery, and development of robotic servicing for refueling and repair of satellites may increase the potential for on-orbit accidents and resulting debris. Research in this area will determine and examine payload design factors related to safety and

document and assess specific payload safety measures, both relative to launch, orbital, and reentry safety. It will assess the need for safety criteria for various kinds of payloads and, where necessary, develop safety criteria. The rapid development of new types of payloads will make this an area with a continued need for research.

2. Environmental Issues ($200)

As a regulatory agency, OCST is responsible for compliance with the National Environmental Policy Act (NEPA) and the Clean Air Act of 1990, and has issued Environmental Impact Statements (EIS) for commercial activities at existing national ranges and guidelines for EIS development for future commercial spaceports. Proposed commercial launches will require the preparation of Environmental Impact Statements. The commercial reentry vehicle program requires that OCST prepare an Environment Impact Statement for that program. OCST is in the process of completing a joint Federal/State Environmental Impact Statement with the State of Hawaii. Similar arrangements have been initiated with Florida and other proposed commercial launch sites. The possibility of off-shore launch facilities; introduction of different vehicles; payloads containing biological materials, new substances, and hazardous materials; and their return to earth raises new environmental issues and required reviews that will be addressed by this research.

3. Orbital Safety ($250)

The Commercial Space Launch Act (the Act) broadly defines "launch vehicle" in a manner that includes many types of spacecraft. The Act defines a launch vehicle as "any vehicle constructed for the purpose of operating in, or placing a payload in, outer space and any suborbital rocket." Thus, systems such as rockets, and reentry vehicles all fall within this broad definition of launch vehicles.

Because of potentially high relative velocities and intersecting orbits, virtually every space vehicle creates the risk of catastrophic collision. The trend toward smaller, less expensive satellites will increase the number of objects and potential for collision. For example, constellations of these small satellites providing mobile communications will soon occupy low earth orbits. Maneuverability of satellites for reentry will add a new dimension to orbital safety. The entry of additional countries and launch facilities into the international space arena has complicated these matters.

The National Aeronautics and Space Administration Authorization for Fiscal Year 1991 expresses the sense of Congress that "the space related activities of the United States should be conducted in a manner that does not increase the amount of orbital debris". The Department of Transportation is the Federal agency responsible for studying the commercial regulatory options and

economic impacts of any debris minimization requirements imposed on the commercial space transportation industry. Because debris is an international problem with commercial dimensions, any regulatory actions must consider the impact on international competitiveness. OCST will determine commercial space transportation factors that affect orbital safety and consider various regulatory actions designed to mitigate potential hazards. It will utilize data from NASA and the Air Force on the degree of orbital hazards produced by long-term space exposure of satellite systems, e.g., flaking paint, and other debris generation. Research in this area will necessarily extend into the foreseeable future because of rapid expansion of the number and type of commercial activities in space. Research and international agreements will drive additional rulemaking and regulatory action.

C. INDUSTRY POLICY AND PLANNING $800

Objectives: To develop policy initiatives in order to foster commercial space transportation by the U.S. private sector, as directed by the Commercial Space Launch Act, as amended; to encourage private sector responsibility for development and maintenance of national space transportation capability; to identify national space commercial launch vehicle and infrastructure needs and to assess alternative means of meeting those needs; to facilitate the strengthening and expansion of U.S. space transportation launch architecture and infrastructure; to analyze current and emerging economic and policy issues in order to facilitate the emergence of a strong, competitive U.S. commercial space transportation industry; to estimate future requirements for space launches of telecommunications, materials processing, remote sensing, navigation, position location, science, and other payloads; to monitor and assess the performance, reliability, availability, and price of U.S. and foreign launch services in order to gauge the international competitiveness of the U.S. commercial space transportation industry; and to advocate free and fair international competition in commercial launches.

Accomplishments:

OCST provided leadership in the interagency process to stress the importance of monitoring unfair trading practices conducted by non-market economies, including the Soviet Union and the People's Republic of China.

OCST participated in the drafting of National Space Council commercial space policy documents that establish a framework for the operation of the commercial sector in space.

OCST served as the primary source of briefing materials and documentation for the Secretary and Deputy Secretary regarding the status of the commercial space transportation sector, including the needs and impact of regulation, review of the role

of government in impeding or assisting the growth and development of the commercial space transportation sector, and trends in private investment in financing the industry.

OCST developed the operational Space Transportation Analysis and Research (STAR) Database for use in economic and policy analysis of the U.S. commercial space transportation industry.

OCST serves as the primary government resource for information regarding the demand for commercial launches for communications, materials processing, remote sensing, navigation, position location, science, and other payloads; the supply of commercial launch services in the domestic and international markets; summaries and analyses of policies pertaining to the U.S. commercial space launch industry; assessments of the international competitiveness of the U.S. commercial space transportation industry; and the infrastructure needs of the U.S. commercial launch providers.

Total Cost To Date: $750

FY 1990 & 1991 Costs: $400 & $350

FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
$800	$800	$800	$800	$800

1. Commercial and Government Space Launch Trends ($140)

OCST must assess the space launch requirements of the Government and commercial sectors in order to advise the Secretary and National Space Council of needed space transportation architecture and subsequent commercial derivatives. Government need for commercial launch services and industry market potential has a direct impact on the availability and sufficiency of national infrastructure. Launch vehicles, telemetry, payload integration, and launch pads are included in this area of concern. OCST is the primary source of data for information on how commercial requirements factor into national needs.

Potential and current market activity in communications, materials processing, remote sensing, navigation, position location, and scientific missions must be included in any assessment of national space transportation activity.

OCST will analyze the criteria used by domestic and foreign payload owners to select providers of launch services, including responsiveness to customer needs, reliability, and rapid response capabilities. This analysis will determine whether U.S. government policies are serving as market barriers to industry as it seeks customers. The analysis in this section will seek to validate concerns about market barriers and provide a basis for any recommended changes in U.S. policies.

OCST will use the findings and conclusions of these analyses and assessments to structure its promotional, policy, regulatory, and research activities.

2. Space Launch Systems Analysis ($180)

OCST will continue to assess U.S. and foreign launch systems and will monitor their marketing, production, and prices. OCST will also monitor international agreements relating to commercial space transportation, such as the U.S./China agreement.

OCST will collect data in order to quantify the subsidization of foreign launch service operators through supports to research, development and range facilities. These data will provide the basis for trade negotiations conducted with the Europeans, Soviets, the People's Republic of China, and other space faring nations.

A major focus of this effort will be to document the current state of launch vehicle technology and technological developments affecting the industry. This effort will be directed at both domestic and foreign systems, and will be critical to assessing the long-term ability of the U.S. commercial industry to compete in the international launch market. OCST will use the findings and conclusions of its analyses and this assessment to shape and direct future promotional, policy, regulatory and research activities, and to support its educational initiative.

OCST will participate in proposing ways in which current governmental technology initiatives may also assist the U.S. commercial launch industry. This will include recommendations to DOD and NASA on ways to improve the existing ELV fleet, as well as developing initiatives to foster the commercial spin-off potential of new U.S. space transportation programs.

3. Space Transportation Analysis and Research (STAR) Database ($200)

OCST will continue to upgrade and expand the STAR Database, which contains information on launch vehicles, launch sites, launch providers, launches, and payloads.

The STAR Database provides a comprehensive, coherent, and accessible means of obtaining comparable information on a variety of U.S. and foreign launch systems. Using the information contained in the database, OCST is able to monitor, assess, and evaluate developments in the worldwide market for space transportation in order to provide DOT with the means to formulate commercial space launch policy.

A major initiative will be to expand the company and organizations file in the Database. This task will help to define the number and types of companies that comprise the commercial space transportation industry and how these companies

are related to each other and the rest of the economy. As part of this effort, OCST will gather data on employment and income generated by the U.S. commercial space transportation industry. OCST will assess the national and regional economic importance of the industry as well as its contributions to the Nation's balance of trade. Such information will better enable OCST to analyze the economic benefits of a strong competitive U.S. commercial launch industry.

Information from the Star Database is also important in formulating regulatory policy and performing regulatory impact analyses to determine the effects of alternative regulatory approaches in order to select the best approaches for ensuring public safety without unnecessarily hindering industry development and competitiveness.

4. Regulatory Impact Analysis ($140)

As an office having regulatory responsibilities, OCST is required to analyze the economic impacts of proposed regulatory actions on all entities potentially affected by such actions. The growth of the commercial space transportation industry to encompass new activities such as vehicle reentry and the development of commercial launch facilities drives the need for regulatory initiatives by the Licensing Programs Division. The complex and changing relationships among various segments of commercial space transportation and related industries, including the dynamics of international competition and government policy initiatives, will place additional demands on resources and OCST's policy analysts to perform the regulatory impact analyses resulting from licensing initiatives.

OCST will use the findings and conclusions of the analyses to support its licensing and other regulatory initiatives. For example, this effort will allow OCST to compare and contrast alternative approaches to implementation of the licensing program, financial responsibility requirements, and various methods of imposing user fees.

5. Economic Conversion ($140)

OCST will address issues associated with maintaining or re-directing critical industrial capabilities that have been focused primarily on meeting military requirements. OCST will use the findings and conclusions of the assessment in ongoing policy development activities. For example, this effort will enable OCST to analyze the economic impacts on the U.S. commercial launch industry of alternative uses of surplus ballistic missiles assets.

D. PROGRAM SUPPORT $100

Objectives: To facilitate the growth and competitive vigor of the U.S. commercial space transportation industry and the awareness of its accomplishments; to make sure that information about the industry is available to Congress, other government agencies, within the industry and to the general public; to demonstrate within this country and internationally that the U.S. commercial space launch industry has broad support and backing by the U.S. government and is prepared to compete aggressively in the world market; and to communicate the challenges, excitement, and rewards of participation in the commercial space launch industry as a means to stimulate American students to greater interest in math and science education.

Accomplishments:

OCST continued its program of support and representation for the U.S. commercial space transportation launch industry, participating in both domestic and international conferences and symposia. Since the U.S. space launch system is dependent upon the use of government launch facilities, it is crucial to the industry's international competitiveness that the government demonstrates its commitment to the success and reliability of U.S. launch services. Through active participation in a number of national and international space conferences and expositions, OCST helped to carry out this responsibility.

Through the news media, industry contacts and audio-visual and printed materials, OCST fostered greater understanding and support for the commercial space transportation industry. Greater efforts were also put into explaining the needs and potential of the industry to Congress and to other elements of the government. Plans were also made for an expanded Education Initiative to promote greater participation in science, engineering and math studies, particularly by women and minorities.

Total Cost To Date: $90

FY 1990 & FY 1991 Costs: $50 & $40

FY 1992	FY 1993	FY 1994	FY 1995	FY 1996
$100	$100	$100	$100	$100

1. Industry Activities ($65)

In keeping with its statutory responsibility to promote and encourage launches by the commercial space launch industry, OCST will undertake an aggressive outreach program through active participation in industry conferences, seminars exhibitions and other fora. The office will use graphic exhibits, printed materials and audiovisuals to publicize its programs and procedures and to demonstrate the U.S. commitment to a

competitive and healthy U.S. space launch services industry. As a young and evolving industry, there is a constant flow of new ideas, developing strategies and technological breakthroughs. These are communicated largely through the conferences and similar gatherings, or through site visits. To carry out the responsibilities of OCST, it is essential that the office be fully engaged in these activities and have a presence in industry affairs. In essence, OCST has to be a "player" to carry out its mandate. These efforts will emphasize the role of space transportation in the overall National Transportation Policy (NTP) and the Secretary of Transportation's commitment to the launch industry. OCST will work with Members of Congress and their staffs to enhance the competitiveness of the U.S. space launch industry and the economic benefits it can bring to the nation. OCST will also provide support and staffing for the Commercial Space Transportation Advisory Committee, the top level industry group which provides advice and guidance to the Secretary and the Department on a variety of space transportation related topics.

2. Public Liaison Activities ($15)

OCST will work for greater public understanding and support for the U.S. commercial space transportation industry and increased knowledge of the contribution it can make to the domestic economy. Through the general news media, both print and electronic, through participation in public meetings, and through the creation and distribution of informational materials, the office will educate the public about the importance of this industry to both the economy and national security. The message will consistently stress the place of this industry in the National Transportation Policy (NTP) and the contribution it makes to our technological base.

3. Education Initiative ($20)

To fulfill the Secretary of Transportation's and the President's initiative to increase the numbers of women, minorities, and disadvantaged in the transportation work force, OCST will work with universities, other educational institutions, industry and community groups to meet this goal. OCST will help foster a greater awareness of space transportation as a potential career through greater use of the Department of Transportation's service academies and training institutions and will promote cooperative programs with universities in combination with public agencies and the private sector. In an effort to continue to carry out an ongoing exchange of knowledge and innovative ideas among professionals as well as students, OCST will continue to participate in conferences such as the National Conference on Blacks in Higher Education, Annual Pacific Region aerospace enthusiasts conference, science fairs, and the like. These educational initiatives are part of the implementation of the Secretary's National Transportation Policy.